

EPBC 2010/5419 Compliance Report 2018

Dampier Highway Duplication Project

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Dampier Highway Duplication Project

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29-Nov-2018

Job No.: 60589441

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Quality Information

Document EPBC 2010/5419 Compliance Report 2018

Ref 60589441

Date 29-Nov-2018

Prepared by A Chinnery

Reviewed by J Shaw

Revision History


Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	10-Oct-2018	Draft		
B	08-Nov-2018	Draft		
C	28-Nov-2018	Amended for Client Comment	Jamie Shaw Group Lead - Environment	
0	29-Nov-2018	Final for Issue	Jamie Shaw Group Lead - Environment	

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Executive Summary

This Compliance Report has been prepared by AECOM Australia on behalf of Main Roads Western Australia (Main Roads). The purpose of this Compliance Report is to satisfy the requirements of Condition 3 of *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)* approval EPBC 2010/5419 for the Dampier Highway Duplication Project (the Project).

The Project is situated between Karratha and Dampier in the Pilbara region of Western Australia, between Balmoral Road East to the Burrup Road intersection in the west. The Project began as a staged project in 2007 and was completed in March 2013.

The referred action was approved on 22 July 2011 and commenced on 7 November 2011. All works from Bayly Avenue to Burrup Peninsula Rd were completed in 28 February 2013.

A compliance table was previously prepared and updated on the Main Roads website in August 2013. This report has been prepared in order to follow up on outstanding items identified within this previous assessment in accordance with the DotEE Annual Compliance Report Guidelines 2014 and covers the period 7 November 2011 to 30 November 2013.

A review of the project compliance against the conditions of EPBC 2010/5419 determined that two conditions were non-compliant: Condition 3 and part of Condition 10. Both non-compliances relate to reporting and did not result in environmental harm. Given that the project is completed, and all other conditions were compliant, corrective actions are necessary to address the non-compliances.

1.0 Introduction

This Compliance Report has been prepared by AECOM Australia on behalf of Main Roads Western Australia (Main Roads). The purpose of this Compliance Report is to satisfy the requirements of Condition 3 of *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)* approval EPBC 2010/5419 for the Dampier Highway Duplication Project (the Project).

2.0 Description of Activities

The Project is situated between Karratha and Dampier in the Pilbara region of Western Australia, between Balmoral Road East to the Burrup Road intersection in the west. The Project began as a staged project in 2007 and was completed in March 2013.

The Project involved the construction of 12.3 km of highway with twelve intersecting roads along the section. These works were carried out by Contractor Highway Works Albem Joint Venture (HWAJV) and included:

- new carriageways of the duplicated highway
- the construction of a bridge, built parallel to an existing bridge where the alignment of the duplicated passes across the Seven Mile Creek
- minor improvements to pedestrian links and amenity
- improvements to the existing lanes of Dampier Highway to provide for an ultimate configuration offering 2 m sealed shoulders to allow for on-road cycling and a 9 m median.

Due to the occurrence of two EPBC listed species in the vicinity of the Project Area, two stages of the Project were referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC, now Department of the Environment and Energy [DotEE]) for assessment under the EPBC Act in 2010. The referred action was for Stage 2 (Cinders Rd to Burrup Peninsula Rd) and Stage 6 (Bayly Avenue intersection to Cinders Road), described as follows:

Duplication of the Dampier Highway to a 4 lane (2 lanes each way) dual carriage way between the northern end of the causeway at the Dampier Salt Works and the Dampier Highway/Burrup Peninsula Road intersection.

The referred action was approved on 22 July 2011 and commenced on 7 November 2011. All works from Bayly Avenue to Burrup Peninsula Rd were completed in 28 February 2013. The staging of the project as provided in referral documentation for EPBC 2010/5419 is provided in **Appendix A**.

3.0 EPBC Approval Conditions

3.1 Compliance assessment

A compliance table was previously prepared and updated on the Main Roads website in August 2013 (**Appendix B**). This report has been prepared in order to follow up on outstanding items identified within this previous assessment, accordance with the DotEE Annual Compliance Report Guidelines 2014 and covers the period 7 November 2011 to 30 November 2013. As per the guidelines the following status terminology was applied to each condition of the approval:

- Compliant – all the requirements of a condition have been met, including the implementation of management plans or other measures required by those conditions.
- Non-compliant – the requirements of a condition or elements of a condition, including the implementation of management plans and other measures, have not been met.
- Not applicable – the requirements of a condition or elements of a condition fall outside of the scope of the current reporting period.

Table 1 EPBC approval conditions compliance table

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
1	Within 30 days from the commencement of the action, the person taking the action must advise the Department in writing of the actual date of commencement.	Compliant	Letter to DSEWPaC enclosed with previous compliance report. Commencement date is taken as 7 November 2011. This condition was closed out in the 2013 CAR (Appendix B).
2	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to all the conditions required by this approval (EPBC 2010/5419), and make them available to the Department upon request.	Compliant	Main Roads has maintained accurate records substantiating all activities relevant to all required approval conditions. These records are available to the Department from within the Main Roads data documentation system.
3	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	Non-compliant	A compliance report was prepared on the 8 August 2013, published on the Main Roads website as per the requirements of the condition. This report remained available on the website for the duration of the project. The report for the period 7 November 2011 to 30 November 2013 addresses overall compliance of the project against conditions. As annual reporting was not conducted this represents a non-compliance against the condition.
4	The person taking the action must prepare a Fauna Management Plan (FMP), in consultation with the WA DEC, which maximises the ongoing protection and long term conservation of EPBC Act listed threatened fauna species. The person taking the action must not commence the action until the plan is approved by the Minister.	Compliant	A Fauna Management Plan (FMP) was prepared in consultation with the WA Department of Conservation (now Department of Biodiversity, Conservation and Attractions). The FMP was designed to maximise the ongoing protection and long term conservation of EPBC Act Listed threatened fauna species and submitted to DSEWPaC for approval prior to the commencement of any construction works in the area. The FMP was approved by DSEWPaC in October 2011 and construction work commenced in November 2011. This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
4A	A final alignment plan showing locations of fauna friendly culverts that maximise the benefits for EPBC Act listed species. These culverts must be designed in consultation with a suitably qualified ecologist	Compliant	<p>Design of culvert and the locations are as per the approved Fauna Management Plan and suitably qualified ecologist. The culverts were designed to maximise the benefits for the EPBC Act listed species. The culvert locations are:</p> <ul style="list-style-type: none"> • Culvert 1 - Dampier Highway Ch 23,160; • Culvert 2 - Dampier Highway Ch 24,120; • Culvert 3 - Dampier Highway Ch 24,240 • Culvert 4 - Burrup Peninsula Road Ch 760 <p>Culvert 2, 3 and 4 play dual role as underpass as well as for drainage. Culvert entrance/exits are in an area surrounded by rocky outcrop areas; rock piles placed strategically near the entrance and exit of each culvert creating cover for fauna utilising the culvert. All the culverts cross the roads in a straight line and joined.</p> <p>Culvert length was kept as short as possible ensuring adequate natural light penetration from either end of the culvert. Some culverts naturally filled with sediment during water flows creating a natural substrate. However, the road does not cross any major drainage lines, and it is not expected the culverts will experience significant inundation as Karratha/Dampier area receives rain only during cyclonic events and majority of the years it is dry.</p>
4B	A description of measures to prevent mortality of EPBC Act listed threatened fauna species while the action is occurring. This must include details of Pilbara Olive Python clearance surveys to be conducted in any areas to be cleared by a suitably qualified ecologist daily for a week prior to any clearance and details of the relocation of any Pythons that are found	Compliant	<p>Pilbara Olive Python clearance surveys were undertaken during the week 14 - 16 November 2011 and covered a 1 km search radius centred on the Burrup Road Intersection. All fauna located during the search were captured and relocated as detailed in the Field Study Report. The Pilbara Olive Python clearance surveys report was forwarded to DSEWPaC on 16 January 2013.</p> <p>It was not necessary to implement any measures during the construction period as there were no threatened species or other snake species detected. No incidents relating to mortality of EPBC Act listed threatened fauna species, were recorded for the duration of construction.</p>

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
4C	A description of measures to protect EPBC Act listed threatened fauna habitat located adjacent to cleared areas;	Compliant	<p>Measures undertaken as per Fauna Management Plan.</p> <p>a) Clearing was kept to a minimum and the clearing line was pegged/flagged prior to commencing the clearing to ensure to ensure no additional clearing beyond the pegged line.</p> <p>b) The majority of areas are rocky and wherever possible native vegetation which that was cleared was stockpiled and re used for rehabilitation.</p> <p>c) No fire or burning of vegetation was allowed.</p> <p>d) All the vehicles working within the area were fitted with spark arrestors and all employees were inducted and provided with emergency contact numbers.</p> <p>e) Already cleared areas were used for stockpiling the cleared vegetation and top soil.</p> <p>f) Limit creation of access routes and ensure turn around points are located in already cleared areas.</p> <p>This condition was closed out in the 2013 CAR (Appendix B).</p>
4D	A fauna monitoring program (including methodology, timing, scope, duration and reporting)	Compliant	<p>Four stages of fauna monitoring were conducted for the project:</p> <ul style="list-style-type: none"> • January 2013. • April 2013 • July 2013 • November 2013 <p>The July monitoring report was provided to DSEWPaC on 8 August 2013. The final (November) monitoring report is provided in Appendix C.</p>
4Da	measure the mortality of EPBC Act listed threatened fauna associated with the highway duplication	Compliant	<p>A monthly report provided by HWAJV detailing mortality of all fauna species during construction. The most commonly injured fauna was the Rock Wallaby, with a total of nine deaths recorded over the life of the project. These occurred near the intersections of Cinders Road, Holcim Quarry Access and Burrup Road. Carcasses were removed to side of road shoulder. A juvenile King Brown snake was observed passing near the Burrup Road Transformer location. No mortality of EPBC Act listed threatened fauna occurred during the project (Appendix C). Permanent signage has been erected along this section of road advising motorists to take care.</p>

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
4Db	determine the usage and success of culverts in areas of habitat for EPBC Act listed threatened fauna species.	Compliant	The final fauna monitoring program included 720 hours of monitoring with at least 168 hours in each season in order to gauge the success of the underpasses for EPBC listed species. The monitoring report is provided in Appendix C .
4E	Details of reporting to the Minister while the action is occurring to demonstrate compliance with the FMP.	Compliant	FMP Clause 6.2 methodology requires Main Roads to implement a reporting program during construction. Clause 6.2.1 was followed during construction and included monitoring of all fauna death / injury on site (not just EPBC listed species); a log of all reports of deaths and injuries; and a Monthly Report by the Environmental Manager detailing all deaths / injuries. The July fauna monitoring report was provided to DSEWPaC on 8 August 2013 (Appendix D). The final (November) monitoring report is provided in Appendix C .
4-	The approved FMP must be implemented until the expiry of this approval or until otherwise notified by the Minister.	Compliant	The DSEWPaC approved FMP has been implemented during construction activities. The first Annual Construction Fauna Monitoring Report was provided to the Minister on 07 February 13 within three months of the twelve month anniversary of construction commencing (November 2011). Reporting compliance Condition 4(E) EPBC Approval 2010/5419 while the construction took place requires that, if an EPBC Act listed species is killed or injured during construction, notification must be made within one week. Fauna monitoring did not detect the presence of targeted EPBC Act listed species. No mortality of EPBC Act listed species occurred for the duration of the project. Notification of the fauna under pass completion was forwarded to DSEWPaC on 07 February 2013 (as confirmed in the 2013 CAR – Appendix C). The July monitoring report was provided to DSEWPaC on 8 August 2013. The final (November) monitoring report is provided in Appendix D.

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
5	The person taking the action must prepare an Aboriginal Heritage Management Plan (AHMP) which ensures there are no impacts on National Heritage List (NHL) values as a result of the action. The person taking the action must not commence the action until the plan is approved by the Minister. The AHMP is to include:	Compliant	An Aboriginal Heritage Management Plan (AHMP) was prepared in consultation with the appointed Heritage Monitor as well as members of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Community Group, and Yaburara and Coastal Mardudhunera Aboriginal Community. This AHMP was designed to protect and conserve all Heritage Listed sites in the Burrup Peninsula District during construction works in the area and was submitted to DSEWPaC for approval prior to the commencement of any construction works in the area. The AHMP was approved by DSEWPaC in October 2011 prior to construction commencing in November 2011. This condition was closed out in the 2013 CAR (Appendix B).
5A	Management measures to be implemented to prevent or mitigate impacts on the NHL values. This must include:	Compliant	The DSEWPaC approved AHMP was implemented during construction activities. Measures included: <ul style="list-style-type: none"> • Limiting access to NHL places • Restricting vehicle and personnel movement outside of construction boundary. • Demarcation of exclusion zones. • Blast monitoring and implantation of the Blast Management Plan. This condition was closed out in the 2013 CAR (Appendix B).
5Aa	Measures to limit access to the NHL place;	Compliant	A narrow corridor of land was defined as the construction work area and no vehicles were permitted outside the boundary of construction activity. In consultation with Heritage Monitors, NHL places that they considered required fencing were fenced or provided with barriers. In addition to this, access was restricted to sensitive cultural heritage sites by blocking existing roadways and tracks into the area. All movement through the NHL place was conducted in the company of nominated Aboriginal representatives. This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
5Ab	Details of work exclusion zones that will be marked around the project site;	Compliant	In consultation with the Heritage Monitors, exclusion zones were marked around NHL values to assist in the protection and monitoring of the registered sites. Plastic bollards and flagging tapes were used to identify the exclusion zones.
5Ac	Details of fencing around NHL values that are known to exist in close proximity to where construction work will be taking place. This must include sites NHP7, NHP14, NHP16 and NHP18, as identified in the Significant Impacts Report (McDonald, 2010) of the Preliminary Documentation.	Compliant	As agreed with the Heritage Monitors, plastic bollards and flagging tapes were used to identify all NHL sites. Sites NHP7, NHP14, NHP16 and NHP18; which were in close proximity of the construction area, were continuously monitored. In addition to the personnel working in the vicinity of the sites were reminded of the sites during the pre-start meetings. This condition was closed out in the 2013 CAR (Appendix B).
5Ad	Measures to prevent impacts on NHL values from blasting, fly-rock, vibration and dust. This must include a maximum vibration limit of 100mm/s peak particle velocity (PPV) at all NHL values associated with all non-blast construction works; a maximum of 2mm/s PPV at all NHL values associated with ongoing traffic vibration; and the use of small sand bags to stabilise standing stones and stone pits during blasting activity.	Compliant	<p>Following initial blast monitoring and to assist with the prevention of impact on NHL values from fly rock, vibration and dust, in conjunction with Heritage Monitors, it was decided to use a geo-textile cover over the blast site and over the area immediately adjacent to NHL sites.</p> <p>Traffic Bollards were used to further stabilise the areas adjacent to NHL sites, and PPV values were recorded during blast activities.</p> <p>The vibration did not exceed the nominated vibration limit and no disturbance to the EPBC Act listed sites was recorded. The report on vibration monitored during blasting and non-blast construction works was forwarded to DSEWPaC in 2013.</p> <p>Once the roadway was fully completed and opened for traffic, vibration was monitored in May 2013. Vibration levels did not exceed the maximum mm/s PPV nominated in the AHMP. A copy of the Report was forwarded to DSEWPaC in 2013.</p> <p>This condition was closed out in the 2013 CAR (Appendix B).</p>

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
5Ae	Details of monitoring at all known NHL values during construction and for a period of no less than 6 months after construction is complete to ensure PPV does not exceed vibration limits set in the AHMP and there are no impacts on NHL values.	Compliant	Construction occurred from 2011 through to project completion in March 2013. Heritage Monitor Ben Gunn submitted a Report in June 2012 detailing measures undertaken during blasting activities and stating that there had been no impact to any EPBC Act Listed site during construction activities. A record of PPV values is being monitored, to ensure vibration limits in the NHL value area is not exceeded. Heritage Monitor Ben Gunn visited the site in May 2013 and completed a final Close Out Report. A copy of this report was provided to DSEWPaC (Appendix E). This condition was closed out in the 2013 CAR (Appendix B).
5Af	Details of corrective actions to be taken if it is found that vibration limits are exceeded or there is damage to NHL values. This must include monitoring of NHL values to determine if vibration is impacting on these sites and corrective actions, such as road resurfacing or speed limit reductions if it is found that traffic vibration is impacting in NHL values.	Not Applicable	Vibration limits were not exceeded during construction activities and Heritage Monitors have reported no damage to NHL Sites. No corrective action was required. This condition was closed out in the 2013 CAR (Appendix B).
5Ag	Measures to ensure that all activities associated with NHL values are undertaken in consultation with appropriate senior representatives of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Group and Yaburara and Coastal Mardudhunera Aboriginal Corporation and with respect to any cultural sensitivities that may restrict access to those sites;	Compliant	The Heritage Monitor Final Report, provided to DSEWPaC in 2013, indicated that all activities were undertaken in consultation with representatives of the three nominated local Aboriginal Groups with respect to all cultural sensitivities. The report also concludes that restricted access to NHL sites was in place and no damage occurred to any site, with no corrective action required (Appendix E). This condition was closed out in the 2013 CAR (Appendix B).
5Ah	Details of engagement of a heritage monitor on site during construction, and details related to that person's identity and role (e.g. name, contact details, and a description of what is required to fulfil the role of heritage monitor);	Compliant	Robert (Ben) Gunn was appointed as Heritage Monitor during construction. Ben has over 20 years experience in managing and surveying Aboriginal sites throughout Australia. This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
5B	Details of monitoring to be undertaken to determine the success of the management measures proposed to prevent or mitigate impacts on the NHL values. This must include photos, taken from fixed points, of heritage sites before and after any construction activities;	Compliant	Monitoring Points were established and Photos / videos were taken of all NHL sites (before, during and after blasting). This condition was closed out in the 2013 CAR (Appendix B).
5C	Details of corrective actions to be taken if it is found that there are any impacts on NHL values. Any impact on the values of the NHL place caused by the person during the taking of the action must be immediately reported to the Department;	Not Applicable	Heritage Monitor Ben Gunn stated in his Final Assessment (Report June 2012) that when the bollards and mat covers were removed, no damage was noted to any of the sites as a result of the road works (Appendix E). The proximity of the road works to site NHP01 was an initial concern, however no damage was caused by the blasting or the adjacent movement of heavy machinery. As there has been no impact on the NHL place, no action is required.
5D	Details of who is responsible for heritage management measures, including their qualifications, position or status as a separate contractor and details of agreement from third parties to assume responsibility for management actions;	Compliant	Responsibilities were outlined within the approved AHMP. This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
5E	Details of reporting to the Minister while the action is occurring to demonstrate compliance with the AHMP;	Compliant	<p>The AHMP included reporting requirements around corrective actions and the discovery of new sites. If the following triggers occur all blasting activity were to be ceased:</p> <ul style="list-style-type: none"> • measured PPV exceeds PPV limit, • measured PPV velocities exceed by more than 50% the calculated PPV specified in the Approved Blast Design; • if any sign of impact on heritage sites or infrastructure from blasting activity; <p>After halting blasting activities, findings were to be reported, cause investigated, and situation rectified. Main Roads would investigate possible control strategies so as to prevent further adverse impact, and implement strategies and action arising from investigations.</p> <p>At no instance during blasting did PPV exceed the allowable limit. Measured PPV velocities did not exceed the calculated PPV by more than 50%, and no impact on heritage sites from blasting activity was noted, therefore no reporting action was required.</p>
5F	Details of reporting to the Minister if any new sites or artefacts are found during construction.	Compliant	<p>AHMP Section 4.1 Reporting to the Minister - states that the Project Director Brian Norris (Main Roads), on advice from the Heritage Monitor, will follow procedure if new sites or artefacts are found during construction, and implement contingency actions proposed in Table 8.</p> <p>The Heritage Monitor Final Report lists details of new sites located during construction which were then reported to Department of Indigenous Affairs. None of the new sites were impacted by the construction works. The new sites were given allocations NHP-26 Grinding Patch; NHP-27 Surface Scatter and NHP-28 Petroglyph.</p>
5-	The approved Aboriginal Heritage Management Plan (AHMP) must be implemented until the expiry of this approval or until otherwise notified by the Minister.	Compliant	The DSEWPaC approved AHMP was implemented during all construction activities. Road design was altered to minimise any impact on Aboriginal heritage sites. This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
6	The person taking the action must prepare a Blast Management Plan (BMP), which ensures there are no impacts on NHL values as a result of the action. The person taking the action must not commence the action until the plan is approved by the Minister. The BMP is to include:	Compliant	A Blast Management Plan (BMP) was prepared in consultation with Heritage Monitors. Approval of the BMP was given by DSEWPaC in October 2011 and Blasting commenced in January 2012. This condition was closed out in the 2013 CAR (Appendix B).
6A	Details of the maximum PPV levels to be set at NHL values to ensure there are no impacts on NHL values associated with blasting. This should be prepared in consultation with a Heritage Monitor;	Compliant	The predicted PPV values for each proposed blast were included in the Blast Design submission prior to approval. This condition was closed out in the 2013 CAR (Appendix B).
6B	Details of monitoring at all known NHL values during blasting to ensure PPV does not exceed the agreed limits at any of these sites;	Compliant	This condition was closed out in the 2013 CAR (Appendix B).
6C	Measures to ensure that no NHL values are impacted by fly rock from blasting or any aspect of the construction process. Any blasting carried out within 20m of NHL values must incorporate secondary blast controls in the form of cover on the blast and NHL values, such as (but not necessarily limited to) blast matting. Any NHL values assessed as unstable must also be stabilised with sandbags;	Compliant	<p>Following the recommendation of the AHMP, protective measures such as geomattng and a gravel layer were implemented over select Heritage places prior to blasting. Specific details of protection of each NHL site are included in Heritage Monitor Report dated June 2012.</p> <p>Following the first blast, Heritage Monitors revisited and assessed Heritage Places. At each NHL Site, Aboriginal monitors were consulted to confirm that no damage had been done, and whether additional protection was needed for future blasts. In all instances they were Aboriginal monitors were satisfied that the NHL sites did not require further protection.</p> <p>Heritage Monitor Ben Gunn stated in his Final Assessment (Report June 2012) that no damage was noted to any of the sites as a result of the road works. A copy of this report was provided to DSEWPaC (Appendix E).</p>
6D	Details of monitoring at all known NHL values during blasting to identify any damage to NHL values. This must include photos, taken from fixed points, of heritage sites before and after any blasting activities;	Compliant	Photo and Video monitoring points of all NHL sites were established prior to each blast. These points were marked to enable precise positioning of the hand held camera, and enable detection of any fly rock or other minor changes within the photographs. This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
6E	Details of corrective actions to be taken if it is found that fly-rock or vibration have damaged NHL values, including ceasing all works should vibration levels exceed the agreed limits in the BMP and/or a NHL value is found to be disturbed, damaged or destroyed. Works must only restart once details of corrective actions have been provided to the Department and approved by the Minister.	Not Applicable	Heritage Monitors were present during and after all blasting activities. During the first blasting there was a single case of stemming ejection from one of the holes - as an additional protection both to the sites and roadway, a geo-textile cover was placed over the area immediately adjacent to NHL sites, which suppressed both rock and dust movement. At each subsequent blast, the Heritage Monitors reported no damage to NHL sites and as such no further action was required, as per the approved BMP. Heritage Monitor Ben Gunn stated in his Final Assessment (Report June 2012) that no damage was noted to any of the sites as a result of the road works. A copy of this report was provided to DSEWPaC (Appendix E).
6F	Measures to ensure that all fly-rock and vibration protection measures are undertaken in consultation with appropriate senior representatives of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Group and Yaburara and Coastal Mardudhunera Aboriginal Corporation and with respect to any cultural sensitivities that may restrict access to heritage sites. A suitably qualified Heritage Monitor must be engaged during all blasting activities;	Compliant	Nominated senior representatives of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Group, and Yaburara and Coastal Mardudhunera Aboriginal Corporation, as well as the nominated Heritage Monitor, were present before and after all blasting activities during construction. Robert (Ben) Gunn was appointed as Heritage Monitor during construction. Ben has over 20 years experience in managing and surveying Aboriginal sites throughout Australia. This condition was closed out in the 2013 CAR (Appendix B).
6G	Details of who is responsible for blast management measures, including their qualifications, position or status as a separate contractor and details of agreement from third parties to assume responsibility for management actions;	Compliant	BMP Section 2.2 Organisational Structure lists the names and responsibilities during blasting activities on the construction site. This condition was closed out in the 2013 CAR (Appendix B).
6H	Details of reporting to the Minister during construction to demonstrate compliance with the BMP.	Compliant	This condition was closed out in the 2013 CAR (Appendix B).

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
6-	The approved Blast Management Plan must be implemented until the expiry of this approval or until otherwise notified by the Minister.	Compliant	The DSEWPaC approved BMP was implemented during construction activities. This condition was closed out in the 2013 CAR (Appendix B).
7	If the person taking the action wishes to carry out any activity otherwise than in accordance with any of the management plans as specified in the conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of that management plan. The varied activity must not commence until the person taking the action has received written approval of the varied management plan from the Minister. The Minister will not approve a varied management plan unless the varied management plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the varied management plan, that management plan must be implemented in place of the management plan originally approved.	Compliant	A change was made to the AHMP in early 2012. Approval was obtained from DSEWPaC for Ken Mulvaney to be included as a supplementary Heritage Monitor during any temporary absence of Ben Gunn. No other changes were made to the AHMP for the life of the project.
8	If the Minister believes that it is necessary or convenient for the better protection of the NHL values or EPBC Act listed threatened species, the Minister may request that the person taking the action make specified revisions to an approved management plan and submit the revised management plan for the Minister's written approval. The person taking the action must comply with any such request. The revised approved management plan must be implemented in place of the management plan originally approved.	Not Applicable	There was no contact from the Minister during the project requesting that revisions be made to the approved management plans.

Condition Number / Reference	Condition	Compliance Status	Evidence / Comments
9	Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of the date on which approval of the plan is granted.	Compliant	Copies of Blast Management Plan, Fauna Management Plan and Aboriginal Heritage Management Plan were published to the Main Roads Web Site for the duration of the project. This condition was closed out in the 2013 CAR (Appendix B).
10	The person taking the action must provide a payment of \$50,000 to the WA DEC prior to road operation commencing and a further \$50,000 five years after the date of the first payment, as a contribution to an existing trust fund agreed to by the Department, for the better protection and long term conservation of EPBC Act listed threatened fauna species on the Burrup Peninsula of Western Australia. The trust fund must coordinate research on the Pilbara Olive Python and Northern Quoll, that focuses on the following matters amongst others: a) lifecycles; b) threatening processes; c) appropriate land management measures; d) identification of habitat requirements and important populations on the Burrup Peninsula; and e) long term conservation requirements to ensure persistence of the species.	Compliant	Main Roads paid a sum of \$50,000 to WA DEC in 2013 (to an existing trust fund) agreed by the Department. These funds will be utilised for the better protection and long-term conservation of EPBC Act listed threatened fauna species specifically on the Burrup Peninsula of Western Australia. A further \$50,000 was paid to WA Department of Parks and Wildlife in March 2018 (Appendix D). The research program focusses on lifecycles; threatening processes; appropriate land management measures; identification of habitat requirements and important populations on the Burrup Peninsula; and long-term conservation requirement to ensure persistence of the Pilbara Olive Python and Northern Quoll.
10-	Within 28 days of each payment to the WA DEC documentary evidence must be provided to the Department showing that the financial contributions to the trust fund have been provided.	Non-compliant	Documentary evidence of the initial payment was forwarded to DSEWPAC on 6 March 2013. No notification was provided to the Department of the Environment and Energy for the 2018 payment. This represents a non-compliance, however this 2018 CAR represents notification of the payment.

3.2 Environmental Management Plans

Three management plans were required under approval conditions 4, 5 and 6:

- Fauna Management Plan (FMP)
- Aboriginal Heritage Management Plan (AHMP)
- Blast Management Plan (BMP)

Main Roads provided the approved copies of these management plans to the contractor HWAJV. The plans were implemented during the project as summarised in Table 1.

3.3 Non-compliances

A review of the project compliance against the conditions of EPBC 2010/5419 determined that two conditions were non-compliant (Table 2). Both non-compliances relate to reporting and did not result in environmental harm. Given that the project is completed, and all other conditions were compliant, corrective actions are necessary to address the non-compliances.

Table 2 Non-compliances

Condition Number / Reference	Condition	Evidence / Comments
3	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	A compliance report was prepared on the 8 August 2013, published on the Main Roads website as per the requirements of the condition. This report remained available on the website for the duration of the project. This report for the period August 2013 to 31 March 2013 addresses overall compliance of the project against conditions. As annual reporting was not conducted this represents a non-compliance against the condition.
10-	Within 28 days of each payment to the WA DEC documentary evidence must be provided to the Department showing that the financial contributions to the trust fund have been provided.	Documentary evidence of the initial payment was forwarded to DSEWPAC on 6 March 2013. No notification was provided to the Department of the Environment and Energy for the 2018 payment. This represents a non-compliance, however as this 2018 CAR represents notification of the payment.

3.4 New environmental risks

Environmental risks were monitored ongoing during the implementation of the action, through the Main Roads incident reporting system. During the life of the project only one incident relevant to MNES was recorded.

On 1 September 2011 nesting Welcome Swallows (Migratory) were noted to be nesting under the existing Bridge 1127. In order to allow sandblasting activities to commence, Main Roads contacted the Department of Environment Conservation (now Department of Biodiversity, Conservation and Attractions) so that an officer could inspect and remove nests. Following this mitigation, no further changes to fauna management for the project was necessary.

4.0 Conclusion

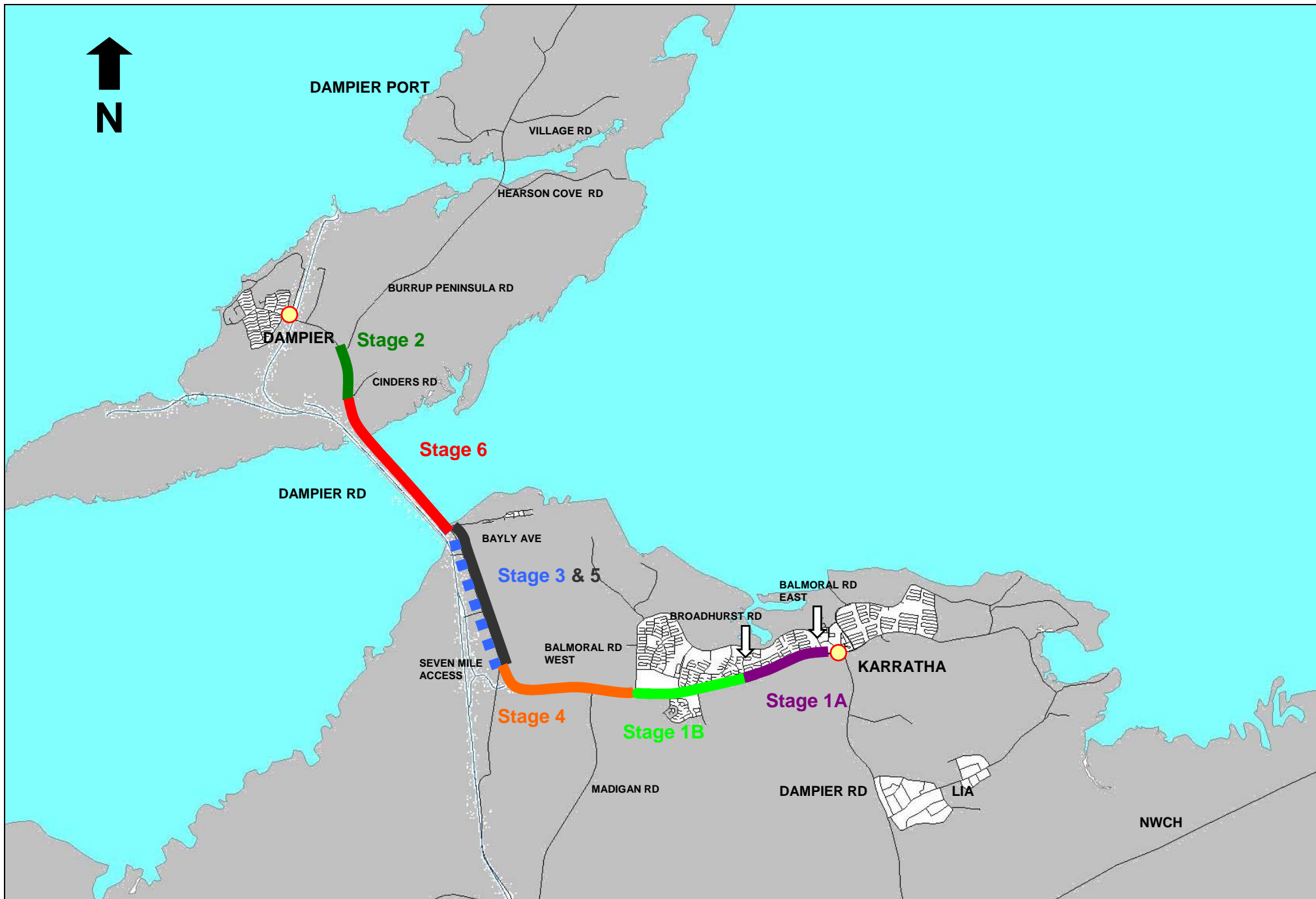
As outlined in Table 1 and Table 2 of this Compliance Report, Main Roads has completed all required actions under EPBC 2010/5419, with two non compliances for non reporting. As this report closes out these non compliances, Main Roads considers the status for conditions and commitments under EPBC 2010/5419 to be completed.

Although the approval has effect until 31 December 2041 Main Roads proposes to cease annual compliance reporting for EPBC 2010/5419, as all other remaining conditions of the approval have been satisfied. Main Roads will continue to manage and maintain their assets consistent with their corporate policies and requirements.

Appendix A

Dampier Highway Upgrade Staging

Appendix A Dampier Highway Upgrade Staging



Appendix B

2013 CAR Table

Appendix B 2013 CAR Table

Conditions of Approval from SEWPaC for Stage 2 of Dampier Highway Duplication Contract 304/08

COMPLIANCE REPORT 05 - 08 August 2013

Action required in the near future.

No.	Condition	Condition Met	Comments
1	Within 30 days from the commencement of the action , the person taking the action must advise the Department in writing of the actual date of commencement.	17/11/2011	Letter to SEWPaC enclosed with notes on initial monitoring. Commencement date is taken as 7 November 2011.
2	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to all the conditions required by this approval (EPBC 2010/5419), and make them available to the Department upon request.	✓	MRWA has maintained accurate records substantiating all activities relevant to all required approval conditions. These records are available to the Department from within the MRWA data documentation system.
3	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	Publish report by 7 February 2013	SEWPAC was notified that the action has commenced on 7 November 2011. Preparation has commenced for Reporting to the Minister and publishing to the Main Roads WA Web Site. This report covers all compliance conditions, and gives details of implementation of specified management plans.
4	The person taking the action must prepare a Fauna Management Plan (FMP), in consultation with the WA DEC, which maximises the ongoing protection and long term conservation of EPBC Act listed threatened fauna species. The person taking the action must not commence the action until the plan is approved by the Minister. The FMP must include:	14/10/2011	A Fauna Management Plan (FMP) was prepared in consultation with the WA DEC. This FMP was designed to maximise the ongoing protection and long term conservation of EPBC Act Listed threatened fauna species and submitted to SEWPaC for approval prior to the commencement of any construction works in the area. The FMP was approved by SEWPaC in October 2011 and construction work commenced in November 2011

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No.	Condition	Condition Met	Comments
4A	A final alignment plan showing locations of fauna friendly culverts that maximise the benefits for EPBC Act listed species. These culverts must be designed in consultation with a suitably qualified ecologist ;	<p style="text-align: center;">✓</p> <p>February 2013</p> <p>April 2013</p> <p>July 2013</p>	<p>Design of culvert and the locations are as per the approved Fauna Management Plan and suitably qualified ecologist. The culverts were designed to maximise the benefits for the EPBC Act listed species. The culvert locations are :-</p> <p>Culvert 1 - Dampier Highway Ch 23,160; Culvert 2 - Dampier Highway Ch 24,120; Culvert 3 - Dampier Highway Ch 24,240 Culvert 4 - Burrup Peninsula Road Ch 760</p> <p>Culvert 2, 3 and 4 play dual role as underpass as well as for drainage. Culvert entrance/exits are in an area surrounded by rocky outcrop areas; rock piles placed strategically near the entrance and exit of each culvert creating cover for fauna utilising the culvert; All the culverts cross the roads in a straight line and joined. Culvert length kept as short as possible ensuring adequate natural light penetration from either end of the culvert; culverts naturally filled with sediment during water flows creating a natural substrate. The road does not cross any major drainage lines, and it is not expected the culverts will experience significant inundation as Karratha/Dampier area receives rain only during cyclonic events and majority of the years it is dry</p> <p>A fauna underpass monitoring program has already begun. According to the SEWPaC approved Fauna management plan it is a requirement to monitor the underpasses for 7days continuously at three months interval for a year. The initial monitoring was carried out during January 2013 with subsequent monitoring took place during April and July 2013 and the reports have been forwarded to SEWPaC.</p> <p># It is proposed to carry out the final monitoring during October 2013.</p>

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No.	Condition	Condition Met	Comments
4B	A description of measures to prevent mortality of EPBC Act listed threatened fauna species while the action is occurring. This must include details of Pilbara Olive Python clearance surveys to be conducted in any areas to be cleared by a suitably qualified ecologist daily for a week prior to any clearance and details of the relocation of any Pythons that are found;	Report Prepared 22 November 2011.	<p>Pilbara Olive Python clearance surveys was undertaken during the week 14 - 16 November 2011 and covered a 1 km search radius centred on the Burrup Road Intersection. All fauna located during the search were captured and relocated as detailed in the Field Study Report. Captured fauna moved away rapidly at the time of release indicating no adverse effects. A 'Procedure for Ongoing Searches during construction' was included as part of the Field Study Report. Also included a Species Identification, Behaviour and Potential Habitat, which has been a useful tool for construction personnel.</p> <p>The Pilbara Olive Python clearance surveys report was forwarded to SEWPaC on 16 January 2013.</p> <p>Pilbara Olive Python and other snake species relocated recording form along with the instructions have been provided to the personnel working within the area., Instructions also included on handling, storage and relocation guide as well as direction concerning prevention of snake bites and first aid measures to be followed.</p> <p>It was not necessary to implement any measures during the construction period as there were no threatened species or other snake species detected. It may be due to the fact in the presence of personnel and machinery it is unlikely the species tend to wander around the cleared/construction areas.</p>
4C	A description of measures to protect EPBC Act listed threatened fauna habitat located adjacent to cleared areas;	✓	<p>Measures undertaken as per Fauna Management Plan.</p> <ul style="list-style-type: none"> a) Clearing was kept to a minimum and the clearing line was pegged/flagged prior to commencing the clearing to ensure to ensure no additional clearing beyond the pegged line. b) The majority areas are rocky and wherever possible native vegetation which is cleared was stockpiled and re used for rehabilitation. c) No fire or burning of vegetation was allowed. d) All the vehicles working within the area were fitted with spark arrestors and all employees were inducted and provided with emergency contact numbers. e) Already cleared areas were used for stockpiling the cleared vegetation and top soil. f) No access route provided except for the construction machinery and for turn around already cleared areas was used.
4D	A fauna monitoring program (including methodology, timing, scope, duration and reporting) which will:		Fauna monitoring program was implemented as per SEWPaC approved FMP and described above.

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No.	Condition	Condition Met	Comments
4D(a)	measure the mortality of EPBC Act listed threatened fauna associated with the highway duplication;	Continues	Monthly Report provided by HWAJV detailing mortality of all species during construction. To date the most common species being injured in the construction corridor has been the Rock Wallaby, with a total of nine deaths recorded. These occurred near the intersections of Cinders Road, Holcim Quarry Access and Burrup Road. Carcasses were removed to side of road shoulder. A juvenile King Brown snake was observed passing near the Burrup Road Transformer location. No EPBC Act listed threatened fauna have been sighted. Signage is in place advising motorists to take care when travelling along this section of road. Photos are provided showing signage.
4D(b)	determine the usage and success of culverts in areas of habitat for EPBC Act listed threatened fauna species.	February 2013 April 2013 July 2013	According to the SEWPaC approved Fauna management plan it is a requirement to monitor the underpasses for 7days continuously at three months interval for a year. The initial monitoring was carried out during January 2013 with further monitoring taking place in April and July 2013 and the reports have been forwarded to SEWPaC. # It is proposed to carry out the final monitoring during October 2013.
4E	Details of reporting to the Minister while the action is occurring to demonstrate compliance with the FMP.	7 Feb 2013	FMP Clause 6.2 methodology requires MRWA to implement a reporting program during construction. Clause 6.2.1 was followed during construction and included monitoring of all fauna death / injury on site (not just EPBC listed species); a log of all reports of deaths and injuries; and a Monthly Report by the Environmental Manager detailing all deaths / injuries. An Annual Report compiled on fauna monitoring was forwarded to SEWPaC.on 07 November 2012.
	The approved FMP must be implemented until the expiry of this approval or until otherwise notified by the Minister .	✓	The SEWPaC approved FMP has been implemented during construction activities. Reporting compliance Condition 4(E) EPBC Approval 2010/5419 while the construction took place requires that <ol style="list-style-type: none"> 1. An Annual Construction Fauna Monitoring Report has been provided to the Minister on 07 February 13 within three months of the twelve month anniversary of construction commencing (November 2011). 2. If an EPBC Act listed species is killed or injured during construction, notification must be made within one week - to date no threatened species have been injured or killed. 3. Notification of the fauna under pass completion was forwarded to SEWPaC on 07 February 13.

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No.	Condition	Condition Met	Comments
5	The person taking the action must prepare an Aboriginal Heritage Management Plan (AHMP) which ensures there are no impacts on National Heritage List (NHL) values as a result of the action. The person taking the action must not commence the action until the plan is approved by the Minister. The AHMP is to include:	20/10/2011	An Aboriginal Heritage Management Plan (AHMP) was prepared in consultation with the appointed Heritage Monitor as well as members of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Community Group, and Yaburara and Coastal Mardudhunera Aboriginal Community. This AHMP was designed to protect and conserve all Heritage Listed sites in the Burrup Peninsula District during construction works in the area and was submitted to SEWPaC for approval prior to the commencement of any construction works in the area. AHMP conditions were approved by SEWPaC in October 2011 prior to construction commencing in November 2011.
5A	Management measures to be implemented to prevent or mitigate impacts on the NHL values . This must include:	✓	The SEWPaC approved AHMP has been implemented during construction activities. A narrow corridor of land has been defined as the construction work area and no vehicles were allowed outside the boundary of construction activity. Exclusion zones have been marked around NHL values to assist in the protection and monitoring of the registered sites. All movement through the NHL place have been in the company of nominated Aboriginal representatives. All significant value sites were afforded additional protection during blasting activities. Monitoring activities were carried out for each blast, results of which were included in the Post Blast Report. A Blast Management Plan was prepared and approved by the Minister. Fly rock and vibration protection methods involved further consultation with Aboriginal Groups and changes to specific methodology agreed upon for each potentially affected site.
5A(a)	Measures to limit access to the NHL place ;	✓	In consultation with Heritage Monitors NHL places which they considered required fencing were fenced/ provided with barriers. As well as accesses were restricted to sensitive cultural heritage sites by blocking roadway / tracks into the area.
5A(b)	Details of work exclusion zones that will be marked around the project site;	✓	In consultation with the Heritage Monitors plastic bollards and flagging tapes were used to identify the exclusion zones.
5A(c)	Details of fencing around NHL values that are known to exist in close proximity to where construction work will be taking place. This must include sites NHP7, NHP14, NHP16 and NHP18, as identified in the Significant Impacts Report (McDonald, 2010) of the Preliminary Documentation.	✓	As agreed with the Heritage Monitors - plastic bollards and flagging tapes were used to identify all NHL sites, in particular sites NHP7, NHP14, NHP16 and NHP18 which were located close proximity of the construction area were continuously monitored. In addition to the personnel working in the vicinity of the sites were reminded of the sites during the pre start meeting.

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No.	Condition	Condition Met	Comments
5A(d)	Measures to prevent impacts on NHL values from blasting, fly-rock, vibration and dust. This must include a maximum vibration limit of 100mm/s peak particle velocity (PPV) at all NHL values associated with all non-blast construction works; a maximum of 2mm/s PPV at all NHL values associated with ongoing traffic vibration; and the use of small sand bags to stabilise standing stones and stone pits during blasting activity.	<p style="text-align: center;">✓</p> <p style="text-align: center;">01 February 2013 & 07 February 2013</p> <p style="text-align: center;">May 2013</p>	<p>Following initial blast monitoring and to assist with the prevention of impact on NHL values from fly rock, vibration and dust, in conjunction with Heritage Monitors, it was decided to use a geo-textile cover over the blast site and over the area immediately adjacent to NHL sites. Traffic Bollards were used to further stabilise the areas adjacent to NHL sites, and PPV values were recorded during blast activities, with no disturbance to the EPBC Act listed sites.</p> <p>The report on vibration monitored during blasting and non-blast construction works was forwarded to SEWPaC. In any event the vibration did not exceed the nominated vibration limit.</p> <p>Once the roadway was fully completed and opened for traffic, vibration was monitored in May 2013. Vibration levels did not exceed the maximum mm/s PPV nominated in the AHMP. A copy of the Report was forwarded to SEWPaC.</p>
5A(e)	Details of monitoring at all known NHL values during construction and for a period of no less than 6 months after construction is complete to ensure PPV does not exceed vibration limits set in the AHMP and there are no impacts on NHL values .	<p style="text-align: center;">16 January 2013</p> <p style="text-align: center;">May 2013</p>	<p>Construction is ongoing. Heritage Monitor Ben Gunn submitted a Report in June 2012 detailing measures undertaken during blasting activities, and stating that there had been no impact to any EPBC Act Listed site during construction activities. A record of PPV values is being monitored, to ensure vibration limits in the NHL value area is not exceeded.</p> <p>The interim report prepared by the Heritage Monitor during blasting and a report prepared after the completion of blasting activities have been forwarded to SEWPaC.</p> <p>Heritage Monitor Ben Gunn visited the site in May 2013 and completed a final Close Out Report. A copy of this report has been forwarded to SEWPaC.</p>
5A(f)	Details of corrective actions to be taken if it is found that vibration limits are exceeded or there is damage to NHL values. This must include monitoring of NHL values to determine if vibration is impacting on these sites and corrective actions, such as road resurfacing or speed limit reductions if it is found that traffic vibration is impacting in NHL values.	<p style="text-align: center;">✓</p>	<p>Vibration limits were not exceeded during construction activities and Heritage Monitors have reported no damage to NHL Sites. No corrective action was required.</p>
5A(g)	Measures to ensure that all activities associated with NHL values are undertaken in consultation with appropriate senior representatives of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Group and Yaburara and Coastal Mardudhunera Aboriginal Corporation and with respect to any cultural sensitivities that may restrict access to those sites;	<p style="text-align: center;">June 2012</p>	<p>Refer to Heritage Monitor Final Report which indicated that all activities were undertaken in consultation with representatives of the three nominated local Aboriginal Groups with respect to all cultural sensitivities which restricted access to NHL sites, no damage occurred to any site and no action was required.</p>

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No.	Condition	Condition Met	Comments
5A(h)	Details of engagement of a heritage monitor on site during construction, and details related to that person's identity and role (e.g. name, contact details, and a description of what is required to fulfil the role of heritage monitor);	✓	<p>Robert (Ben) Gunn was appointed as Heritage Monitor during construction. Ben has over 20 years experience in managing and surveying Aboriginal sites throughout Australia. His specialties include rock art recording, management and interpretation. His qualifications include BEd, University of Melbourne; DipArt Preston Institute of Technology; and DipTeach Melbourne Teachers College. Mr Gunn's contact details are : Address 329 Mt Dryden Road Lake Lonsdale Vic 3380 e-mail gunnb@activ8.net.au.</p> <p>The Heritage Monitor job description includes: liaison with the three identified Aboriginal stakeholder groups; liaise between Main Roads WA, the Contractor and SEWPaC; pinpoint identified sites with NH values and supervise the implementation of fencing, sandbagging etc tasks on those sites; monitor sites during blasting; document and report any new sites and/or artefacts located, and report such findings to the Minister; and report the outcome of the Action at the completion of construction, detailing successes and any failures of the management procedures.</p>
5B	Details of monitoring to be undertaken to determine the success of the management measures proposed to prevent or mitigate impacts on the NHL values. This must include photos, taken from fixed points, of heritage sites before and after any construction activities;	✓	Monitoring Points were established and Photos / videos were taken of all NHL sites (before, during and after blasting). During initial blast monitoring, it was discovered that there a single case of stemming ejection from one of the blast holes. As further prevention to restrict impact on NHL values and to ensure complete success of proposed measures, a decision was made to place a geo-textile cover over both the blast site, and over the area adjacent to all NHL sites.
5C	Details of corrective actions to be taken if it is found that there are any impacts on NHL values . Any impact on the values of the NHL place caused by the person during the taking of the action must be immediately reported to the Department ;	✓	<p>Heritage Monitor Ben Gunn stated in his Final Assessment (Report June 2012) that when the bollards and mat covers were removed, no damage was noted to any of the sites as a result of the road works. The proximity of the road works to site NHP01 was an initial concern which proved unwarranted, as no damage was done to the site by the blasting or the adjacent movement of heavy machinery.</p> <p>As there has been no impact on the NHL place, no action is required.</p>

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No.	Condition	Condition Met	Comments
5D	Details of who is responsible for heritage management measures, including their qualifications, position or status as a separate contractor and details of agreement from third parties to assume responsibility for management actions;	✓	<p>Main Roads WA has been the project owner and implementation of the works program was transferred to the Contractor Highway Works Albem Joint Venture (HWAJV) . The established policy for Aboriginal Heritage Management can be found on the Main Roads Website (www.mainroads.wa.gov.au) and is incorporated into contract agreements to clarify responsibilities for Aboriginal Heritage Management in more detail.</p> <p>MRWA were directly responsible during the planning and design phases of the project. The contractor HWAJV was responsible for heritage management during construction, and responsibility extended to ensuring that any issues relating to heritage and pertinent to operation were incorporated into design modifications and the final constructed project.</p>
5E	Details of reporting to the Minister while the action is occurring to demonstrate compliance with the AHMP;	✓	<p>AHMP Section 4.1 Reporting to the Minister - states that the Project Director Brian Norris (MRWA) on advice from the Heritage Monitor will follow procedure if new sites or artefacts are found during construction, and implement contingency actions proposed in Table 8.</p> <p>If measured PPV exceeds PPV limit, measured PPV velocities exceed by more than 50% the calculated PPV specified in the Approved Blast Design; if any sign of impact on heritage sites or infrastructure from blasting activity; all blasting activity is to cease, findings reported, cause investigated and situation rectified; investigate possible control strategies so as to prevent further adverse impact, and implement strategies and action arising from investigations.</p> <p>PPV at no instance during blasting exceeded the allowable limit. Measured PPV velocities did not exceed the calculated PPV by more than 50%, and no impact on heritage sites from blasting activity was noted, therefore no action was required.</p>
5F	Details of reporting to the Minister if any new sites or artefacts are found during construction.	✓	<p>The Heritage Monitor Final Report lists details of new sites located during construction which were then reported to Department of Indigenous Affairs. None of the new sites were impacted by the construction works.</p> <p>The new sites were given allocations NHP-26 Grinding Patch; NHP-27 Surface Scatter and NHP-28 Petroglyph.</p>
	The approved Aboriginal Heritage Management Plan (AHMP) must be implemented until the expiry of this approval or until otherwise notified by the Minister .	✓	<p>The SEWPaC approved AHMP is continually being implemented during construction activities. Road design was altered to minimise any impact on Aboriginal heritage sites. An assessment was made of Significant Impacts on National Heritage values from the road development proposal (JMCD CHM 2010).</p> <p>The AHMP was prepared to maximise the ongoing protection and long term conservation of the NHL values. All employees involved in the construction works underwent an induction which included ensuring they were fully cognizant of their obligations - and the penalties for breaching their obligations - under the EPBC Act 1999 and Aboriginal Heritage Act (1972).</p>

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No.	Condition	Condition Met	Comments
6	The person taking the action must prepare a Blast Management Plan (BMP), which ensures there are no impacts on NHL values as a result of the action. The person taking the action must not commence the action until the plan is approved by the Minister. The BMP is to include:	14/10/2011	A Blast Management Plan (BMP) was prepared in consultation with Heritage Monitors. This BMP was designed to ensure that there would be no impact on Heritage Listed sites in the Burrup Peninsula District as a result of the construction activities in the area. Blasting did not commence prior to approval of the BMP by the Minister. Approval of the BMP was given by SEWPaC in October 2011 and Blasting commenced in January 2012.
6A	Details of the maximum PPV levels to be set at NHL values to ensure there are no impacts on NHL values associated with blasting. This should be prepared in consultation with a Heritage Monitor ;	✓	The predicted Peak Particle velocity (PPV) values for each proposed blast were included in the Blast Design submission prior to approval. The method of calculating the PPV was set in accordance with AS 2187 2006. The maximum allowable predicted blast vibration level for Petroglyphic rock engravings was 100mm/sec. The blast design for each blast was approved by a registered contract Blast Consultant, who confirmed that all predicted PPV levels were within the agreed limits prior to issuing a Permit to Blast. A vibration monitoring report detailing actual PPV levels was submitted following each blast.
6B	Details of monitoring at all known NHL values during blasting to ensure PPV does not exceed the agreed limits at any of these sites;	✓	A pre-blast review was undertaken by a blasting consultant for every blast carried out on site to ensure predicted vibration levels did not exceed the Maximum agreed limits. Blasts did not take place until the consultant had issued a Permit to Blast. All predicted PPV values were well below the Max PPV limit agreed. During each blast, vibration levels were recorded and a vibration monitoring report submitted detailing actual PPV values showing they did not exceed the agreed limit.
6C	Measures to ensure that no NHL values are impacted by fly rock from blasting or any aspect of the construction process. Any blasting carried out within 20m of NHL values must incorporate secondary blast controls in the form of cover on the blast and NHL values, such as (but not necessarily limited to) blast matting. Any NHL values assessed as unstable must also be stabilised with sandbags;	✓	Following the recommendation of the AHMP, protective measures such as geomatting and a gravel layer were implemented over select Heritage places prior to blasting. Specific details of protection of each NHL site are included in Heritage Monitor Report dated June 2012. Following the first blast, Heritage Monitors revisited and assessed Heritage Places. At each NHL Site, Aboriginal monitors were consulted to confirm that no damage had been done, and whether additional protection was needed for future blasts. In all instances they were Aboriginal monitors were satisfied that the NHL sites did not require further protection.
6D	Details of monitoring at all known NHL values during blasting to identify any damage to NHL values . This must include photos, taken from fixed points, of heritage sites before and after any blasting activities;	✓	Photo and Video monitoring points of all NHL sites were established prior to each blast. These points were marked to enable precise positioning of the hand held camera, and enable detection of any fly rock or other minor changes within the photographs.

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No.	Condition	Condition Met	Comments
6E	Details of corrective actions to be taken if it is found that fly-rock or vibration have damaged NHL values, including ceasing all works should vibration levels exceed the agreed limits in the BMP and/or a NHL value is found to be disturbed, damaged or destroyed. Works must only restart once details of corrective actions have been provided to the Department and approved by the Minister.	✓	Heritage Monitors were present during and after all blasting activities. During the first blasting there was a single case of stemming ejection from one of the holes - as an additional protection both to the sites and roadway, a geo-textile cover was placed over the area immediately adjacent to NHL sites, which suppressed both rock and dust movement. At each subsequent blast, the Heritage Monitors reported no damage to NHL sites and as such no further action was required, as per the approved BMP.
6F	Measures to ensure that all fly-rock and vibration protection measures are undertaken in consultation with appropriate senior representatives of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Group and Yaburara and Coastal Mardudhunera Aboriginal Corporation and with respect to any cultural sensitivities that may restrict access to heritage sites. A suitably qualified Heritage Monitor must be engaged during all blasting activities;	✓	Nominated senior representatives of the Ngarluma Aboriginal Corporation, Wong-Goo-Tt-Oo Aboriginal Group, and Yaburara and Coastal Mardudhunera Aboriginal Corporation, as well as the nominated Heritage Monitor, were present before and after all blasting activities during construction. Following discussions with monitors, blast matting was placed over the blast area to restrict fly rock and vibration. Videos taken of each blast clearly show the effectiveness of the matting. With respect to cultural sensitivities, access was restricted to all heritage sites.
6G	Details of who is responsible for blast management measures, including their qualifications, position or status as a separate contractor and details of agreement from third parties to assume responsibility for management actions;	✓	BMP Section 2.2 Organisational Structure lists the names and responsibilities during blasting activities on the construction site. Qualifications, Position Title and Status, and company whether Main Roads or Contractor is clearly listed. Responsibility ranges through contract management, blast design, coordination of blast, set up and initiation of blast, checking for misfires and checking auditing and approving drill and blast designs.
6H	Details of reporting to the Minister during construction to demonstrate compliance with the BMP.	✓	Refer to BMP Attachment 9 - SEWPaC Approval Conditions. The Department was notified in writing of the actual date of commencement of the action. This document forms part of the compliance reporting conditions to the Minister during construction work was forwarded to SEWPaC.
	The approved Blast Management Plan must be implemented until the expiry of this approval or until otherwise notified by the Minister .	✓	The SEWPaC approved BMP was implemented during construction activities. Steps for verifying compliance with blasting procedures was listed in the BMP, and covered the full process from Design, drilling, depth and hole quality, security, design approval, issue of notice, load stem tie in and shot firing, and hold point release. No blast took place on site until all steps had been completed.

Conditions of Approval from SEWPaC for Stage 2 of Dampier Highway Duplication Contract 304/08

No.	Condition	Condition Met	Comments
7	If the person taking the action wishes to carry out any activity otherwise than in accordance with any of the management plans as specified in the conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of that management plan. The varied activity must not commence until the person taking the action has received written approval of the varied management plan from the Minister. The Minister will not approve a varied management plan unless the varied management plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the varied management plan, that management plan must be implemented in place of the management plan originally approved.	31/01/2012	A change was made to the AHMP in early 2012. Approval was obtained from SEWPaC for Ken Mulvaney to be included as a supplementary Heritage Monitor during any temporary absence of Ben Gunn. No other changes were made to the AHMP.
8	If the Minister believes that it is necessary or convenient for the better protection of the NHL values or EPBC Act listed threatened species, the Minister may request that the person taking the action make specified revisions to an approved management plan and submit the revised management plan for the Minister's written approval. The person taking the action must comply with any such request. The revised approved management plan must be implemented in place of the management plan originally approved.		There has been no contact to date from the Minister requesting that revisions be made to the approved management plans, which the Minister believed would be necessary or convenient for the better protection of the NHL values or EPBC Act listed threatened species.
9	Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of the date on which approval of the plan is granted.	✓	Copies of Blast Management Plan, Fauna Management Plan and Aboriginal Heritage Management Plan have been published to the Main Roads Web Site.

Conditions of Approval from SEWPaC for Stage 2 of Dampier Highway Duplication Contract 304/08

No.	Condition	Condition Met	Comments
10	<p>The person taking the action must provide a payment of \$50,000 to the WA DEC prior to road operation commencing and a further \$50,000 five years after the date of the first payment, as a contribution to an existing trust fund agreed to by the Department, for the better protection and long term conservation of EPBC Act listed threatened fauna species on the Burrup Peninsula of Western Australia. The trust fund must coordinate research on the Pilbara Olive Python and Northern Quoll, that focuses on the following matters amongst others:</p> <ul style="list-style-type: none"> a) lifecycles; b) threatening processes; c) appropriate land management measures; d) identification of habitat requirements and important populations on the Burrup Peninsula; and e) long term conservation requirements to ensure persistence of the species. 	<p>Initial payment of \$50,000 to WA DEC was made on 05 March 2013</p> <p style="text-align: center;">✓</p>	<p>MRWA has already paid a sum of \$50,000 to WA DEC (to an existing trust fund) agreed by the Department. These funds will be utilised for the better protection and long term conservation of EPBC Act listed threatened fauna species specifically on the Burrup Peninsula of Western Australia.</p> <p>Research will focus on lifecycles; threatening processes; appropriate land management measures; identification of habitat requirements and important populations on the Burrup Peninsula; and long term conservation requirement to ensure persistence of the Pilbara Olive Python and Northern Quoll.</p> <p># A further \$50,000 will be paid to WA DEC five years after the date of the first payment,</p>
	<p>Within 28 days of each payment to the WA DEC documentary evidence must be provided to the Department showing that the financial contributions to the trust fund have been provided.</p>	<p>06 March 2013</p>	<p>Documentary evidence of the initial payment was forwarded to SEWPAC on 6 March 2013.</p>

Appendix C

Fauna Monitoring Report

Appendix C Fauna Monitoring Report

Fauna underpass monitoring - Final report

Dampier Highway Duplication



Fauna underpass monitoring - Final report

Dampier Highway Duplication

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Quality Information

Document Fauna underpass monitoring - Final report

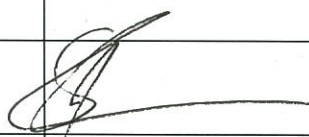
Ref 60248902

Date 27-Nov-2013

Prepared by Matthew Cann

Reviewed by Andrew Batty

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	15-Nov-2013	For Internal Review	Jamie Shaw Associate Director - Environment	
B	25-Nov-2013	For Client Review	Jamie Shaw Associate Director - Environment	
0	27-Nov-2013	For issue to Client	Jamie Shaw Associate Director - Environment	

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Executive summary

AECOM Australia Pty Ltd was engaged by Main Roads Western Australia to undertake four phases of fauna underpass (fauna friendly culverts) monitoring over a twelve month period for the Dampier Highway Duplication Project, situated between Dampier and Karratha in Western Australia's Pilbara region. The objective of the monitoring program was to determine the effectiveness of the underpasses for two conservation significant species (Northern Quoll and Pilbara Olive Python) occurring in the region and thereby closing out the associated environmental approval condition 4 of EPBC Approval 2010/5419 for the project. A total of 30 days (720 hours) of monitoring was required, with a minimum of seven days in each of the seasons. During each phase of the program culverts were monitored simultaneously by two prescribed methods; a) sand pads to record tracks and b) photo traps (Scoutguard "Zero-glow – 8M" covert cameras) located at the openings to the culverts. Monitoring was scheduled to occur at three monthly intervals to capture the full range of seasonal conditions of the tropical climate with distinctive wet (summer) and dry (winter) seasons. This report presents the findings of the fourth and final phase of monitoring, includes a summary of the previous three monitoring events and provides conclusions in relation to the usage and success of the fauna friendly culverts for the target species. In the absence of actual data for the Northern Quoll and Pilbara Olive Python, common fauna are used as surrogate species to provide some insight into the potential effectiveness of the culverts for conservation significant species.

The November phase of monitoring recorded no Northern Quoll or Pilbara Olive Python utilising the culverts. However, general fauna activity increased on July's results with a total of 12 species recorded. This was predicted in the July monitoring phase where the drop off in activity was suggested to have occurred as a result of a drop in temperature at this time of year. Number of fauna observations was high in November with a total of 72 observations. This was due to the general increase in activity, most likely from the increase in average temperature and also due to a high number of Magpie Lark observations at site 3. No target species were observed during this phase of monitoring or during the previous three monitoring events.

Overall monitoring has now been completed as per approval condition 4 of EPBC Approval 2010/5419, condition 4 (D) part (b), that is, 720 hours of monitoring with at least 168 hours in each season to gauge the success of the underpasses for EPBC listed species. This has been achieved. The target species were not observed during the study and as such it is not possible to make conclusions on the effectiveness of the fauna friendly culverts for the target species, however the culverts appeared to be suitable for a range of common fauna species. In this respect the culverts were fauna friendly.

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1.0 Introduction

1.1 Background

In 2001, Main Roads Western Australia (MRWA) identified the need for a second carriageway to supplement the existing carriageway along the Dampier Highway between Karratha and Dampier, in the Pilbara region of Western Australia. The area has experienced increases in population and industrial growth and as a result, higher traffic flow has been experienced along this stretch of highway. Construction of the Dampier Highway Duplication Project began as a staged project in 2007 and was completed in March 2013.

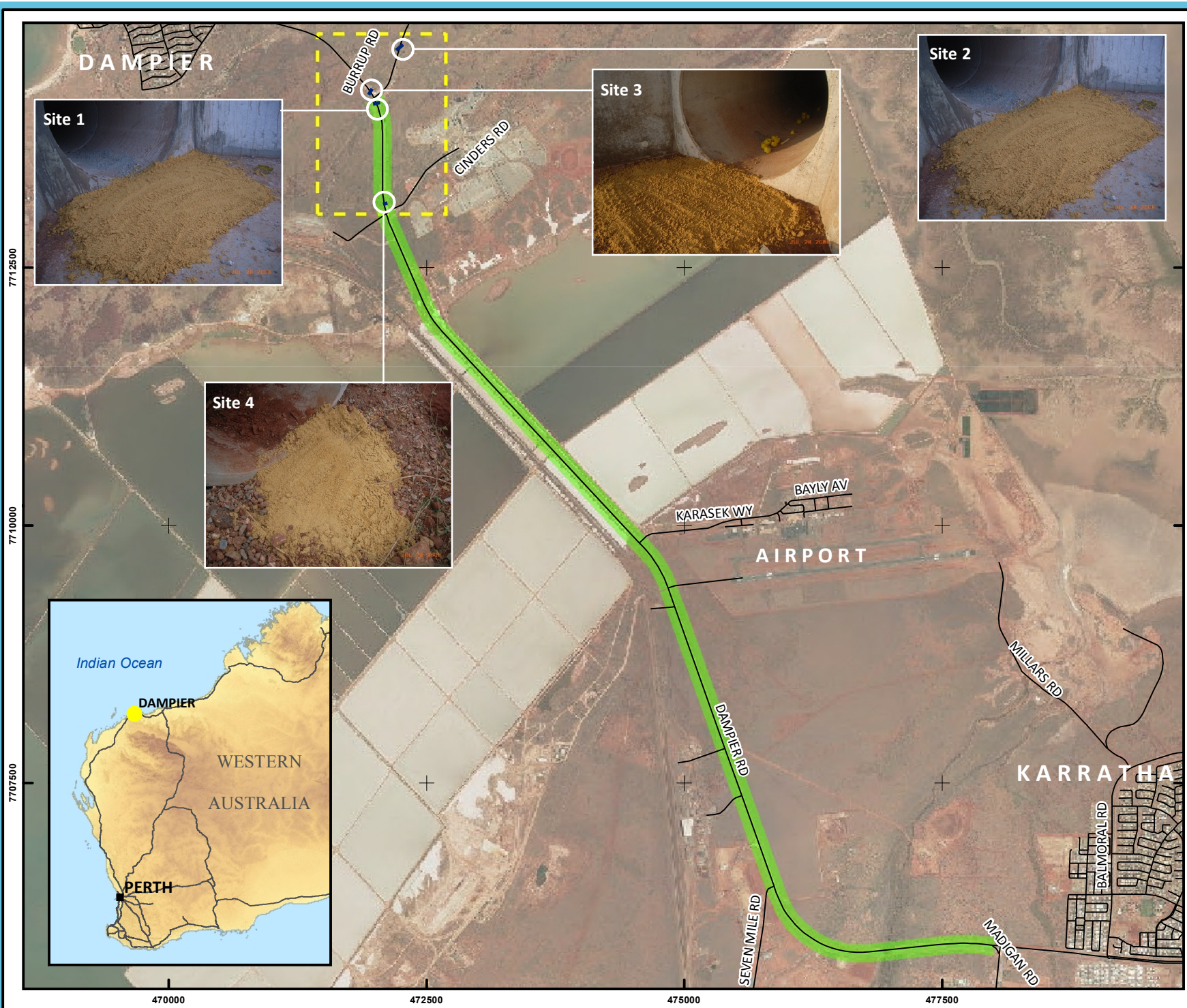
The Dampier Highway Duplication Project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) for assessment under Sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2010 due to the occurrence of two EPBC listed species in the vicinity of the Project Area:

- Northern Quoll, *Dasyurus hallucatus* which is classified as Endangered (facing a very high risk of extinction in the wild) under the EPBC Act and Schedule 1 (fauna that is rare or likely to become extinct) under the *Wildlife Conservation Act 1950* (WC Act). The Quoll is at risk from a number of threatening processes including feral predators, habitat degradation and inappropriate fire regimes, among others (Hill & Ward 2009 in Enviroworks 2011).
- Pilbara Olive Python, *Liasis olivaceus barroni* which is classified as Vulnerable (facing a high risk of extinction in the wild in the medium-term future) under the EPBC Act and Schedule 1 (fauna that is rare or likely to become extinct) under the WC Act. The Olive Python is at risk from a number of Threatening processes including feral predators, predation of food sources by feral predators and habitat degradation, among others (Enviroworks 2011).

Enviroworks (2011) was engaged to develop a Fauna Management Plan for EPBC listed species, in compliance with approval condition 4 of EPBC Approval 2010/5419. Condition 4 (D) part (b), required the implementation of a fauna monitoring program to determine usage and success of fauna friendly culverts by EPBC Act listed fauna. Under the framework provided in Enviroworks (2011), MRWA was required to undertake at least 30 days or 720 hours of monitoring over a 12 month period from the completion of highway construction, with a minimum of 7 days or 168 hours in each season. A range of methods were to be used during the monitoring program.

1.2 Location

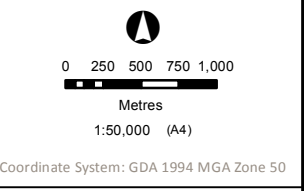
The Dampier Highway Duplication Project is situated between Karratha and Dampier in the Pilbara region of Western Australia and construction lies between Balmoral Road East to the Burrup Road intersection in the west (Figure 1). Enviroworks (2011) proposed fauna underpasses at four locations, situated amongst rocky outcrop areas, which the Dampier Highway intersects. These locations were selected based on topography, engineering constraints and potential habitat for two EPBC listed species. Rocky outcrop areas provide sheltering, feeding and breeding habitat for both the Pilbara Olive Python and Northern Quoll. The underpass locations are displayed in Figure 1.



Location Map and Study Area

Dampier Highway Duplication

Figure 1



- LEGEND**
- Study Area
 - Dampier Highway Duplication
 - Culvert

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1.3 Previous studies

A number of studies have been completed since the beginning of the Dampier Highway Duplication Project. These are listed below:

- Dampier Highway – Dual Carriageway: SLK 7.0 – 25.84 Environmental Impact Assessment and Management Plan (GHD, 2003).
- Duplication of the Dampier Highway between Karratha and Dampier: Assessment of Fauna Values (GHD, 2003).
- Desktop Review and Impact Assessment: Northern Quoll and Pilbara Olive Python Dampier Highway Duplication (Stage 2 and Part of Stage 6) (Enviroworks Consulting, 2010).
- Dampier Highway Duplication Fauna Management Plan – EPBC Listed Species M04 – P09 (Enviroworks, 2011).
- Pilbara Olive Python Survey – Dampier Highway Duplication. Highway Construction Pty Ltd (H08 – J01) (Enviroworks, 2011).
- Dampier Highway Duplication – Fauna Underpass Monitoring January 2013 (AECOM, 2013a).
- Dampier Highway Duplication – Fauna Underpass Monitoring April 2013 (AECOM, 2013b).
- Dampier Highway Duplication – Fauna Underpass Monitoring July 2013 (AECOM, 2013c).

1.4 Objective and scope of works

The objective is to monitor the usage of and comment on the effectiveness of fauna friendly culverts that have been installed in areas of habitat for EPBC Act listed threatened fauna species, Northern Quoll (*Dasyurus hallucatus*) and the Pilbara Olive Python (*Morelia olivacea barroni*). Monitoring is to be undertaken in compliance with Condition 4 (D) of EPBC Approval 2010/5419, specifically to gauge success and usage of installed underpasses over a 12 month period.

A review of relevant documentation indicated that the following scope of works was required:

- underpasses to be monitored at the four locations shown within M04 – P09
- each underpass to be monitored for at least seven days or 168 hours in each season
- at least 40% or 67.2 hours of monitoring to be conducted at night
- monitoring to be conducted either by: sand traps, camera or direct observations by a qualified person
- cameras capable of recording in infrared to be used for night camera trapping
- sand traps to be checked at dawn and dusk
- a report on the observations of fauna underpass monitoring is to be produced at the completion of the monitoring period and sent to MRWA
- following the completion of the monitoring program, a final report is to be issued to MRWA.

1.5 Previous monitoring

1.5.1 January

AECOM undertook the first round of monitoring between 9 and 17 January, 2013 (AECOM 2013a). Each underpass was monitored for a total of 183 hours by infra-red camera at one end of the underpass and between 111 and 183 hours by sand pads at the other end. Inclement weather brought on by cyclone Narelle caused the interruption in sand pad monitoring. A total of 53 photographs and 22 videos were taken from infra-red cameras. Seven photographs recorded fauna and 68 were false triggers. A total of 10 unique tracks were recorded in sand pads. No evidence of the target species was recorded, however the underpasses were shown to be effective for a range of common native and introduced fauna. Recommendations were made in relation to potential modifications to a number of the underpasses in the form of providing shelter at the entrances to encourage better usage by native fauna.

Weather conditions during this phase of monitoring were typical for the region at this time of year, with hot temperatures and high rainfall brought on by Tropical Cyclone Narelle (BOM 2013a).

1.5.2 April

This phase of monitoring occurred for eight consecutive days and nights from 9 to 17 April 2013 (AECOM 2013b). In accordance with the Fauna Management Plan, a combination of sand traps, remote cameras and direct observations were used during the survey. Each underpass was monitored for a total of 183 hours by infra-red camera at one end of the underpass and by sand pads at both ends. A total of 46 photographs and nine videos of fauna were taken from infra-red cameras. A total of six unique track patterns were identified in the sand pads. Modifications to site 4 were observed to have been completed as recommended in the January monitoring report. No evidence of the target species was recorded, however the underpasses were shown to be effective for a range of common native and introduced fauna.

The Project Area experienced typical climatic conditions for this phase of monitoring with maximum temperatures in the mid to high 30s. The mean rainfall for April in the last 30 years is 19.2 mm however no rainfall was recorded during the monitoring period.

1.5.3 July

This phase of monitoring occurred for eight consecutive days and nights from 19 to 27 July 2013 (AECOM 2013c). In accordance with the Fauna Management Plan for the project a combination of sand traps, remote cameras and direct observations were used during the survey and all functioned as planned. Each underpass was monitored for a total of 185 hours by infra-red camera at one end of the underpass and by sand pads at both ends. A total of three species were recorded, a marked decrease from previous phases of monitoring. No evidence of the target species was recorded.

During the July monitoring phase, temperatures were lower than previous phases of monitoring with average maximum temperatures in the low to mid 20s.

2.0 Methodology

2.1 Timing and monitoring methods

This final (fourth) phase of monitoring was conducted over a seven day period between November 08 and November 15 2013 resulting in 169 hours of monitoring. This final phase of monitoring concluded the monitoring program, reaching an accumulated 720 monitoring hours as specified in Enviroworks (2011).

Table 1 Monitoring schedule

	JAN 2013	APR 2013	JUL 2013	NOV 2013
Monitoring days	8	8	8	7
Hours	183	183	185	169
Cumulative hours	183	366	551	720
Completed	Yes	Yes	Yes	Yes

The methods were consistent with the first three phases of monitoring, with the camera setting the only change, as described below.

A combination of sand pads and motion sensing (infra-red) cameras were used in this monitoring program. The requirements of Enviroworks (2011) Fauna Management Plan – EPBC Listed Species (M04 – P09) stated that monitoring shall be conducted using sand traps, cameras or direct observations. By using a combination of sand pads and cameras, rather than just one option, accuracy in identifying the species is increased as photographs can confirm what the tracks retained in the sand pads suggest and vice versa.

At each site, one infra-red camera was installed at one end of the underpass and sand pads were set up at both ends (Table 2 and Table 3). Sand pads accompanied the cameras as a means of testing that the camera photographed all instances of fauna activity. Tracks laid in these sand pads were not included, as the cameras photographed all fauna that used the camera end of the culverts. Site photographs are presented in Table 2 and details in Table 3.

Table 2 Site photographs

Site	Camera	Sand Pad
1		
2		
3		
4		

Table 3 Site details

Site	Trap type	Details	Location	
			Easting	Northing
1	Camera	West side of underpass. Installed on rocks adjacent to opening	471983	7714090
	Sand Pad	East side of underpass	472047	7714101
2	Camera	West Side of Underpass. Installed on rocks near entrance	472204	7714613
	Sand Pad	East side of underpass	472273	7714666
3	Camera	West side of underpass. Installed on rocks near entrance	471940	7714177
	Sand Pad	East side of underpass	471973	7714239
4	Camera	West side of underpass. Installed on rocks adjacent to opening	472077	7713116
	Sand Pad	East side of underpass	472120	7713129

2.2 Infra-red cameras

Scoutguard “Zero-glow – 8M” covert cameras were used at each culvert. These models use infra-red to detect motion, with a range of between eight metres and 15 m, with the motion sensitivity decreasing with increased ambient temperature (User manual). Due to the high temperatures experienced in the Pilbara, sensitivity was set to high. Cameras were set to video mode during this final phase of monitoring. This was done to detect movement of fauna into the underpasses.

Videos from each camera were downloaded *in situ* in the morning and evening to a laptop computer for later review. If no photographs or videos had been taken, the camera was tested for working operation by walking in front of the lens and checking to see if a shot had been fired.

2.3 Sand pads

Yellow sand was used for each of the sand pads. One 20 kg bag of sand was placed outside both entrances of the culvert and inside the culvert to determine whether tracks led inside (Table 2). Prior to placement, the sand was carefully checked for presence of plant matter ensuring none was present. Sand pads were approximately 80 cm x 70 cm, an area of 0.56 m². Each pad was inspected and raked twice a day, within an hour of sunrise and before sunset.

2.4 Data analysis

Images and videos were analysed in a site office during the day. Tracks were identified both in the field and in the site office.

2.5 Weather

Weather conditions recorded over the monitoring period at Karratha Airport (BoM, 2013a), approximately 6 km from the project area, are presented in Table 4. This information will be used to discuss seasonal observations in the final report.

Table 4 Weather statistics at Karratha Airport for Friday 19/07/2013 to Saturday 27/07/2013

Statistic		Fri 08	Sat 09	Sun 10	Mon 11	Tue 12	Wed 13	Thur 14	Fri 15
Maximum Temperature (°C)		38.1	37.2	36.3	37.5	37.2	39.1	41.4	32.7
Minimum Temperature (°C)		24.3	22.9	22.2	24.2	24.5	23.9	22.9	25.7
Rainfall (mm)		0	0	0	0	0	0	0	0
Wind Direction	9am	NNE	ENE	E	NNW	NW	WNW	W	ENE
	3pm	NNW	NNE	NNE	NE	NNE	NW	NW	NE
Wind Speed (km/h)	9am	11	20	31	9	9	13	13	15
	3pm	24	22	26	20	26	19	28	20
Relative Humidity (%)	9am	38	36	29	51	41	44	40	71
	3pm	36	26	29	20	12	35	44	68

2.6 Overall monitoring analysis

For the overall monitoring analysis in this report, data was summarised from previous reports that were submitted to MRWA post monitoring. Data has been correlated against average minimum temperature (°C) to examine the trend between temperature and species richness. Average minimum temperature has been used in this report as much of the activity is generally recorded during night hours, when the minimum temperature is reached.

3.0 Results

3.1 November Monitoring

3.1.1 Time spent monitoring

Precise hours of monitoring spent per day at each site are provided in Table 5.

Table 5 Time spent monitoring (hours)

Date	Site 1		Site 2		Site 3		Site 4	
	Remote sensing camera	Sand Pad	Remote sensing camera	Sand Pad	Remote sensing camera	Sand Pad	Remote sensing camera	Sand Pad
08/11/13	13	13	12	12	12	12	13	13
09/11/13 to 14/11/13	24	24	24	24	24	24	24	24
15/11/13	12	12	13	13	13	13	12	12
Total	169	169	169	169	169	169	169	169

3.1.2 Fauna

One introduced and 11 native species were recorded in the November survey, with seven species captured via video and seven potential species identified from 13 track patterns in the sand pads. The Euro and Cat were recorded by both camera and in the sand pads.

3.1.2.1 Camera traps

Species recorded from the infra-red cameras are listed in Table 6 and images of fauna recorded are presented in Appendix A.

Table 6 Fauna species captured on Scoutguard Cameras

Species	Conservation value	Site	Photo
Mammals			
Euro (<i>Macropus robustus</i>)	Native	1,2,4	Plates 2, 4, 12
Cat (<i>Felis catus</i>)	Introduced	1,2,4	Plates 3, 6, 10
Dragon species	Native	4	Plate 9
Magpie Lark (<i>Grallina cyanoleuca</i>)	Native	1,3	Plates 1, 8
Echidna (<i>Tachyglossus aculeatus</i>)	Native	2	Plate 5
Gecko species	Native	4	Plate 11
Brown Quail (<i>Coturnix ypsilophora</i>)	Native	1	Plate 7

3.1.2.2 Sand pads and other signs

Thirteen (13) track patterns, were identified in the sand pads during the November phase of monitoring representing seven species. Animals identified from these tracks are listed in Table 7. Photographs of track patterns are presented in Appendix B.

Table 7 Species recorded in sand pads or by other signs

Potential Species	Conservation Value	Site	Photo
Mammals			
Euro (<i>Macropus robustus</i>) or (Rothschild's Rock Wallaby (<i>Petrogale rothschildi</i>))	Native	1,4	Plates, 1, 3, 4, 13
Small bird (potentially Magpie Lark)	Native	1,4	Plates, 2, 9
Small reptile species	Native	2,4	Plates, 6, 7, 9, 11
Cat (<i>Felis catus</i>)	Introduced	2	Plate 5
Goanna species	Native	4	Plate 8
Dragon burrow	Native	4	Plate 10
Legless lizard (Potentially <i>Lerista</i> species)	Native	4	Plate 12

3.1.3 Road deaths - Fauna

No road deaths were observed during the November phase of monitoring. This was down on the previous phase (July), during which 2 deaths were recorded.

3.1.4 EPBC Listed Fauna

No Pilbara Olive Python or Northern Quoll was recorded during this November phase of monitoring.

3.2 Overall monitoring results

3.2.1 EPBC Listed Fauna

The target species, Northern Quoll and Pilbara Olive Python were not recorded at any culvert during the monitoring program. No road kill of the target species were recorded.

3.2.2 General Fauna Activity

The average number of species identified over the monitoring period was 9.5 per phase of monitoring. Average number of observations was 41 animals per phase of monitoring.

Species richness across the monitoring period did not fluctuate greatly apart from July, with a marked decrease in species richness to 3. Additionally, the site experienced the lowest average minimum temperature in July. All three of the other phases of monitoring showed higher species richness and average minimum temperatures of above 20 °C.

Results from the January monitoring show a high species richness and high average minimum temperature for the period however an unusually low number of observations were made. Reasons for this are discussed in section 4.2.

April shows a high number of observations and high species richness and November shows the same albeit with a higher number of observations. The results will be further examined in Section 4.2.

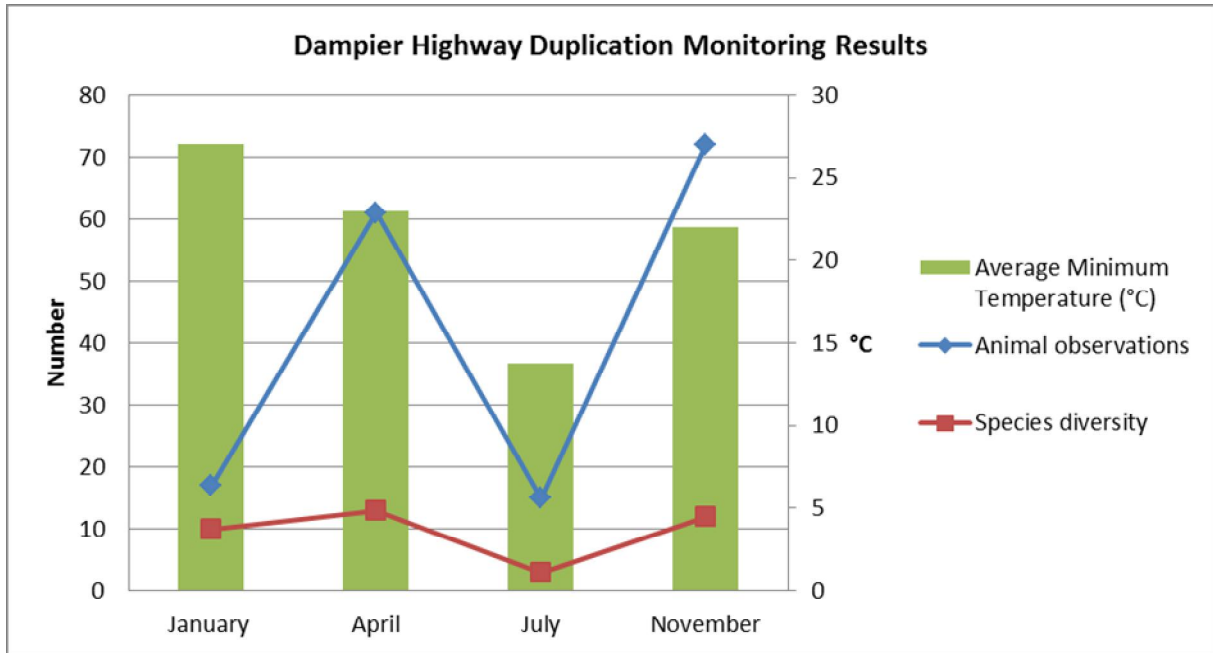


Figure 2 Phase by phase monitoring results

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4.0 Discussion

4.1 November Monitoring

No Northern Quoll or Olive Python was recorded during the fourth and final phase of the fauna underpass monitoring.

As predicted in the interim report for the July phase of monitoring, the level of fauna activity increased in November including both general fauna observations (videos and tracks) and species richness. The increase is likely due to the higher temperatures experienced during November, compared with that of July (AECOM 2013c, Figure 2). The high number of observations in November was due to the presence of Magpie Lark at site 3 which set the camera off numerous times, and from the general increase in activity due to the warmer temperatures.

As in previous phases of monitoring, most fauna captured on the cameras or in the sand pads were typically observed moving towards the culvert, with the occasional animal moving inside. No traversing of the culverts was recorded during this phase of monitoring.

A cat was recorded at sites 1, 2 and 4 however, once again, no sign of predation was observed at any of the culvert entrances, and fauna do not seem discouraged to approach the entrances.

All infra-red cameras functioned throughout the study period and no technical issues arose. Each camera was tested for movement detection each morning and the camera successfully fired off photos. Each site had sufficient areas and materials for mounting.

As consistent with the previous phase of monitoring, sand pads were used at both ends, mainly to confirm whether the cameras were photographing all instances of faunal activity at the culvert entrances. This was confirmed.

No road deaths were observed during this phase of monitoring which is encouraging, given the increase in fauna activity at the site.

4.2 Overall monitoring

4.2.1 General observations

Overall, there appeared to be a link between average temperature and species richness. January, April and November all recorded average minimum temperatures of greater than 20 °C and species richness during these months were close to the average (9.5). During July however, the average minimum temperature dropped to 13.8°C and during this time the site experienced a marked decrease in species richness (6.5<Average).

Fauna observations did fluctuate heavily over the monitoring program with only 17 in January, 61 during April and then 15 in July. July's low result can most likely be explained by the low average minimum temperatures and correlates with the low species richness result. In January however, species richness was close to average and average minimum temperatures were high. The Dampier Highway Duplication Construction Project was nearing the end of completion and works were still underway during the January monitoring. This can most likely explain why the number of fauna observations was low, as animals were reluctant to frequent the disturbed, noisy area.

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5.0 Conclusion

5.1 Completion criteria

Enviroworks (2011) was engaged to develop a Fauna Management Plan for EPBC listed species, in compliance with approval condition 4 of EPBC Approval 2010/5419. Condition 4 (D) part (b), required the implementation of a fauna monitoring program to determine usage and success of fauna underpasses by EPBC Act listed fauna.

Neither of the EPBC Act Listed target species were recorded over this monitoring program. These species are rare in their environment and this is one of the reasons why the species are listed and perhaps why they were not observed in the study. Supporting this conclusion, there are no confirmed/documented records of the Northern Quoll on the Burrup Peninsula in the last 27 years (Enviroworks 2011). The Pilbara Olive Python appears to be relatively more common on the Burrup Peninsula, but more so along water courses and among rock pile landforms. The last records close to the Project Area are a record from 2001 approximately 2km east of the intersection and a record 700 m east of the intersection in 2005 (DEC 2009 in Enviroworks 2011; Tutt *et al* 2002, 2004 in Enviroworks 2011).

Given that more common fauna species have been observed at the entrances, with some moving inside, they should be suitable for the target species, should the target species occur in the area and adjacent to the culverts. The culverts are large enough for the target species to comfortably move through unimpeded. The July monitoring results suggested that movement through the culverts had potentially occurred at sites 1 and 2 however this has not been proven with photographic evidence.

This report satisfies approval condition 4 (D) part (b) of EPBC Approval 2010/5419.

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6.0 References

- AECOM (2013a). Dampier Highway Duplication Fauna Underpass Monitoring (January). Report for Main Roads Western Australia.
- AECOM (2013b). Dampier Highway Duplication Fauna Underpass Monitoring (April). Report for Main Roads Western Australia.
- AECOM (2013c). Dampier Highway Duplication Fauna Underpass Monitoring (July). Report for Main Roads Western Australia.
- Bureau of Meteorology (2013a). Karratha, Western Australia January 2013 Daily Weather Observations <http://www.bom.gov.au/climate/dwo/IDCJDW6064.latest.shtml>. Accessed 1047, 10-16 November 2013.
- Bureau of Meteorology (2013b). Karratha, Western Australia January 2013 Climate statistics for Australian locations <http://www.bom.gov.au/jsp/ncc/cdio/cvg/av> . Accessed 10-16 November 2013.
- Enviroworks (2010). Desktop Review and Impact Assessment: Northern Quoll and Pilbara Olive Python Dampier Highway Duplication (Stage 2 and Part of Stage 6).
- Enviroworks (2011). Pilbara Olive Python Survey – Dampier Highway Duplication. Highway Construction Pty Ltd (H08 – J01).
- Enviroworks (2011). Dampier Highway Duplication Fauna Management Plan – EPBC Listed Species M04 – P09.
- GHD (2003). Dampier Highway – Dual Carriageway: SLK 7.0 – 25.84 Environmental Impact Assessment and Management Plan.
- GHD (2003). Duplication of the Dampier Highway between Karratha and Dampier: Assessment of Fauna Values.

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Appendix A

Infra-red Camera Photographs

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Infra-red camera photographs and videos

Site 1



Plate 1 Maggie Lark (*Grallina cyanoleuca*)



Plate 2 Euro (*Macropus robustus*)



Plate 3 Cat (*Felis catus*)

Site 2



Plate 4 Euro (*Macropus robustus*)



Plate 5 Echidna (*Tachyglossus aculeatus*)



Plate 6 Cat (*Felis catus*)



Plate 7 Brown Quail (*Coturnix ypsilophora*)

Site 3



Plate 8 Magpie Lark (*Grallina cyanoleuca*)

Site 4



Plate 9 Dragon sp



Plate 10 Cat



Plate 11 Gecko species



Plate 12 Euro (*Macropus robustus*)

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Appendix B

Tracks, Scats and Other Signs

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Tracks and other signs of fauna

Site 1



Plate 1 Macropod track



Plate 2 Small bird, potentially Magpie Lark as they are common in the area

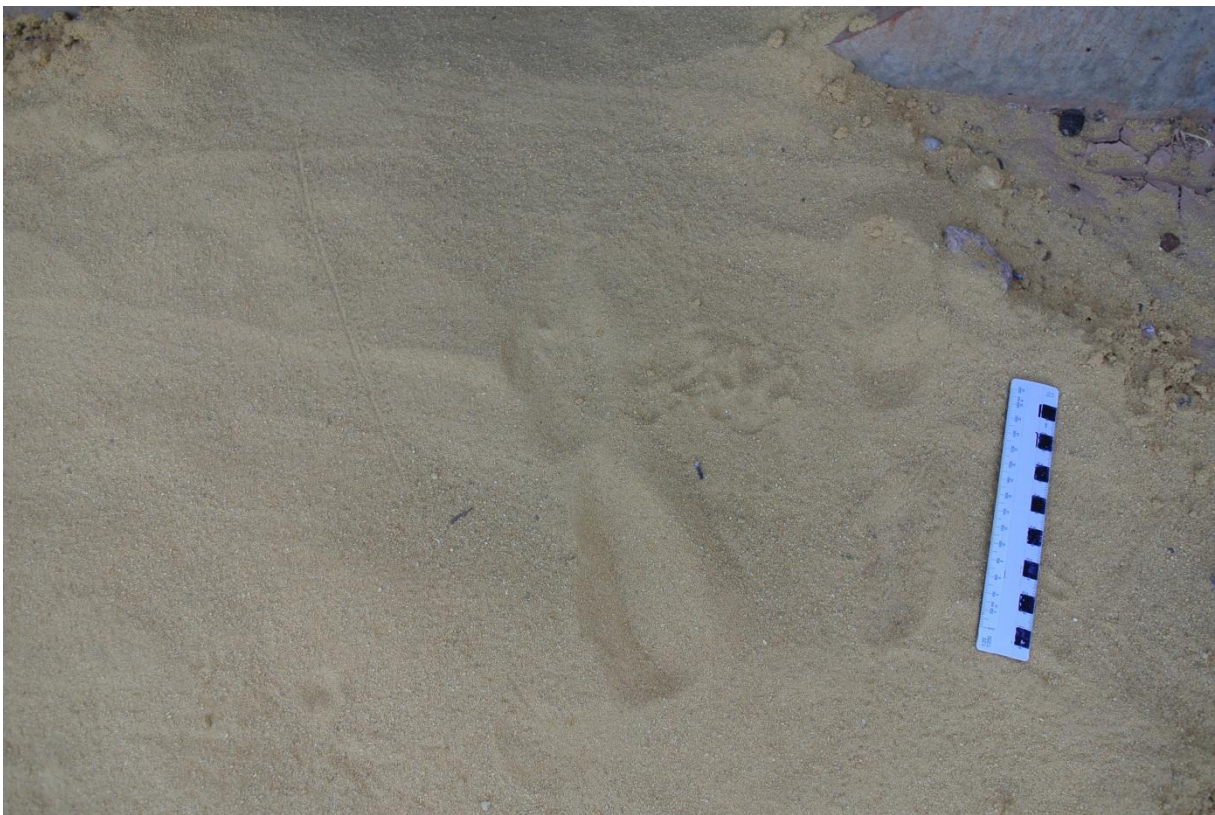


Plate 3 Macropod track



Plate 4 **Macropod track**

Site 2



Plate 5 **Cat walking track pattern**



Plate 6 Small reptile entering culvert

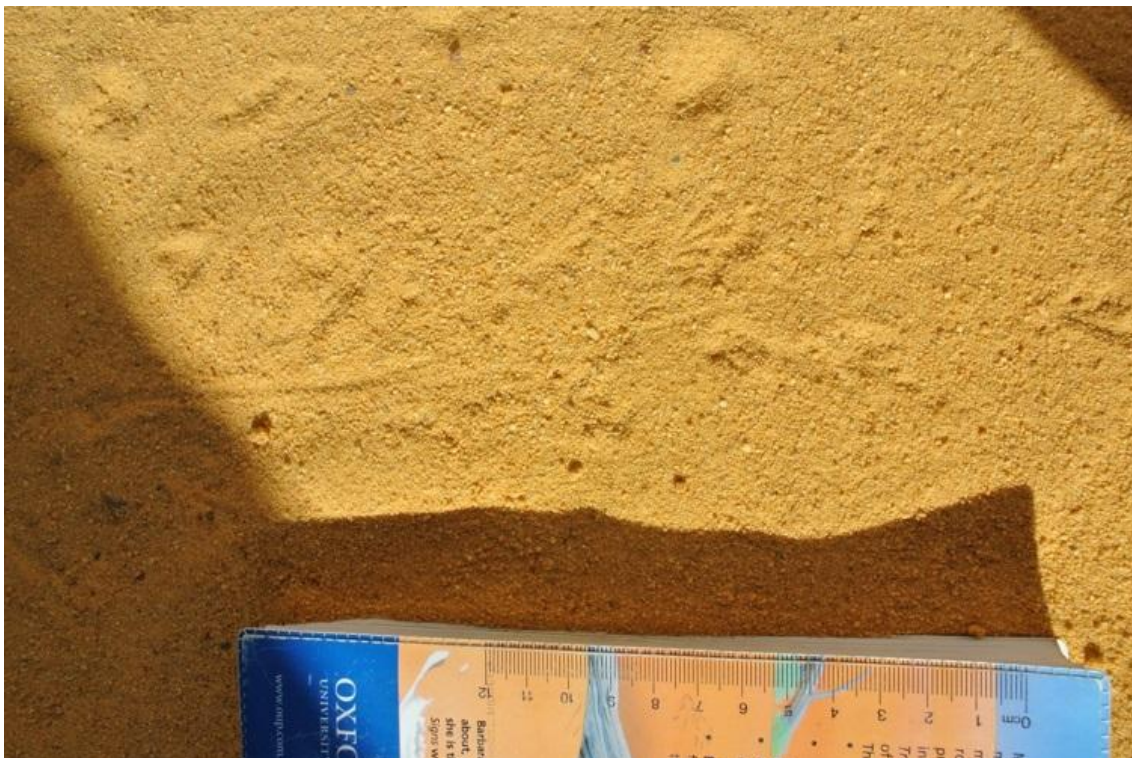


Plate 7 Small reptile, possibly dragon prints

Site 3

Site 4

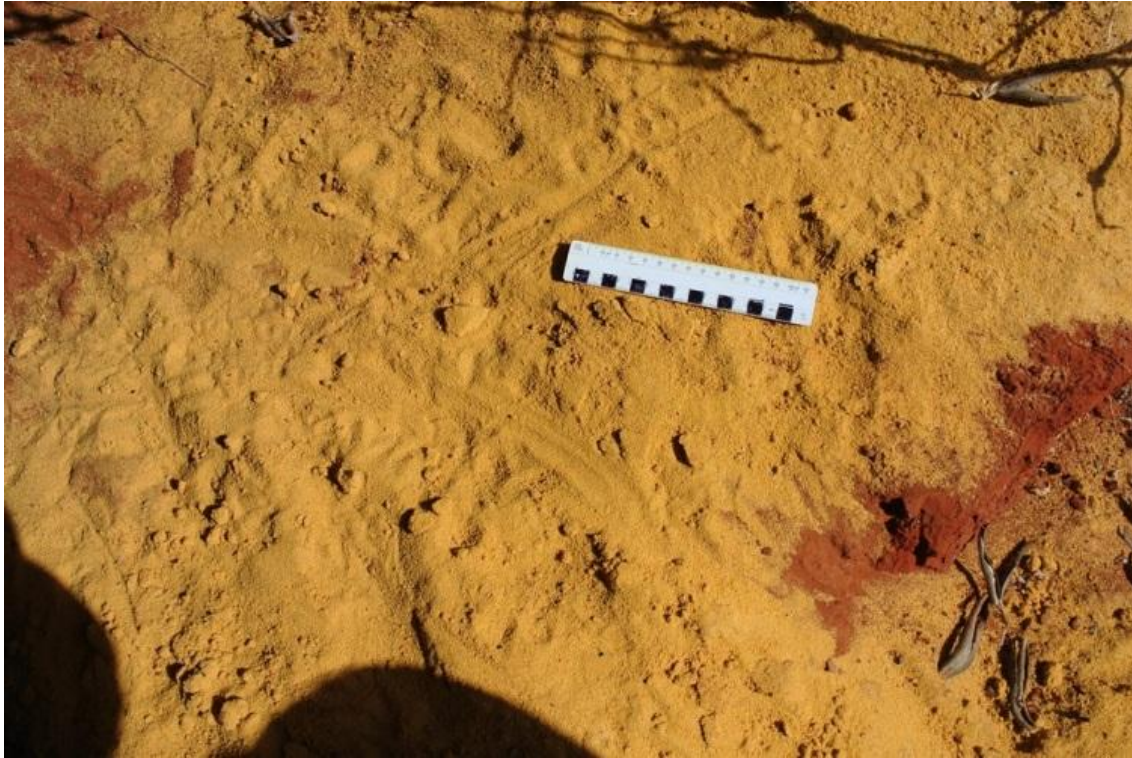


Plate 8 Goanna track



Plate 9 Small bird and small reptile tracks



Plate 10 Dragon burrow in sand pad and entrance to culvert



Plate 11 Small Gecko



Plate 12 Legless Lizard (Potentially *Lerista* sp.)



Plate 13 Macropod tracks

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Appendix D

DBCA Research Receipt

Appendix D DBCA Research Receipt

DEPARTMENT OF PARKS AND WILDLIFE

ABN 38 052 249 024

POSTAL ADDRESS: LOCKED BAG 104,
BENTLEY DELIVERY CENTRE,
BENTLEY WA 6983

6.3.2018

TELEPHONE: (08) 9219 9317

rec 3858

CUSTOMER NO: 2436

CUSTOMER NAME:

Man Roads WA - East Perth

OFFICIAL RECEIPT

DATE	INVOICE DETAILS	BALANCE
	<p>3006</p> <div data-bbox="922 1209 1268 1451" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>INPUT at HEAD OFFICE Date: 08 MAR 2018 Operator</p> </div>	<p>\$55,000.00</p>
	GST	
	TOTAL INCLUDES GST	<p>\$55,000.00</p>

DEPARTMENT OF PARKS AND WILDLIFE

17 DICK PERRY AVENUE, KENSINGTON WA 6151

Elair

From

Sent

To:

Subj

MA

AU

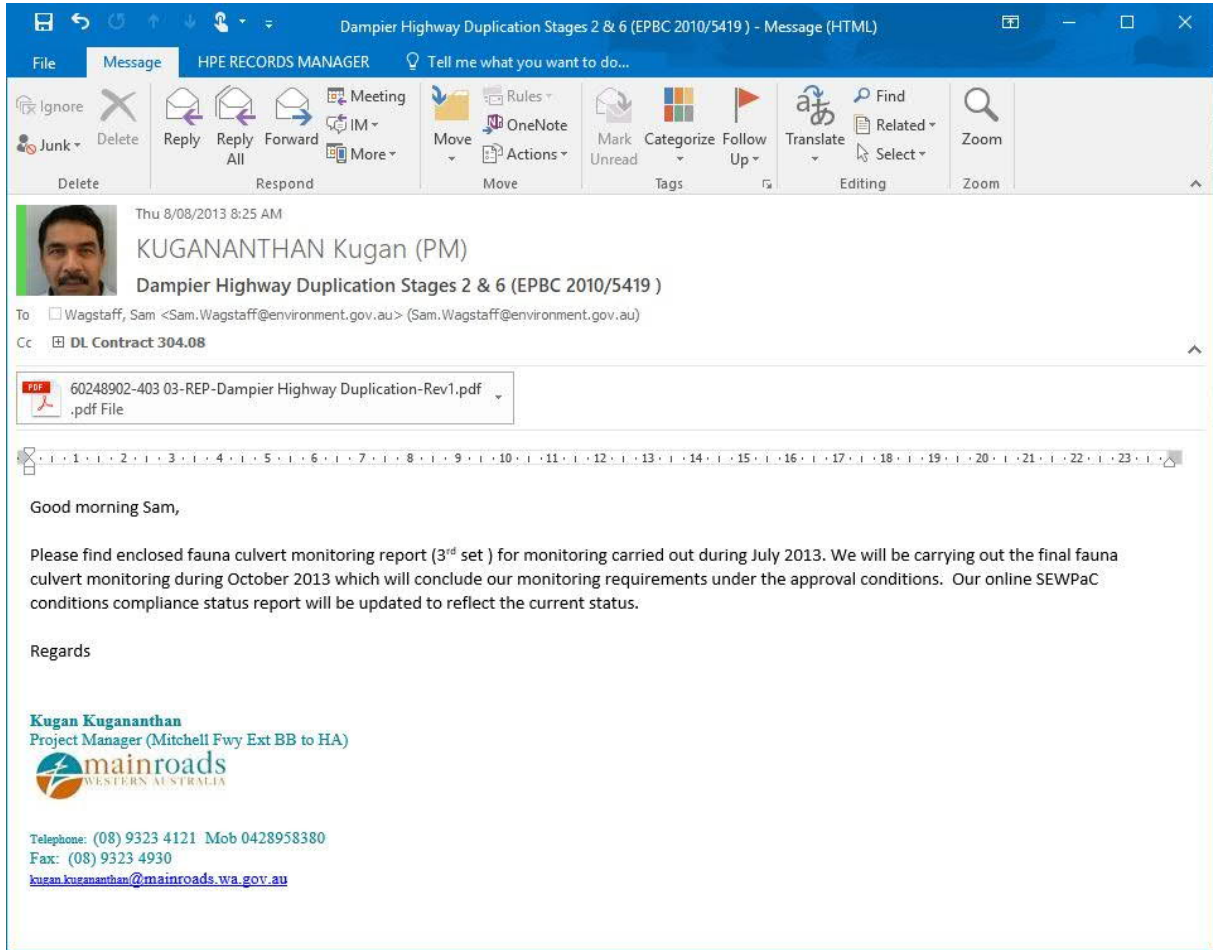
PO

EA

Appendix E

Email to SEWPaC
regarding July Fauna
Monitoring and
Compliance Report

Appendix E Email to SEWPaC regarding July Fauna Monitoring and Compliance Report



Appendix F

Heritage Management
Close Out Report

Appendix F Heritage Management Close Out Report

FINAL CLOSEOUT ON **SITE 20911**, BURRUP INTERSECTION, DAMPIER

A report to
HIGHWAY WORKS ALBEM (HWA) JOINT VENTURE
Claremont, WA 6010

R.G. Gunn
Heritage Consultant (MAACAI)
May 2013

Introduction

At the request of HWA, an inspection of DIA site 20911 was undertaken by the consultant to verify that the site was undamaged as a result of the HWA Dampier Highway works (see JMCHM 2011 and Gunn 2011 and 2012 for background). The site is located to the south of the intersection of Dampier and Burrup Highways, Dampier, and on the eastern side of the road (Figs 1-2). The site was immediately adjacent to the HWA works area (Figs 3-4).

Methods

The visit was conducted on the 24th May 2013 in the company of John Powell (HWA). The weather was fine, with clear skies. Photographs taken during the initial survey (JMCHM 2011) and others taken at the beginning of the project (Gunn 2011) were used to assess the rock outcrop and the petroglyph panel. Both features were re-photographed to verify the findings of this assessment (Figs 4-5).

Results

As a result of the visual inspection of the site and a comparison with prior photographic records, it was determined that the site has not suffered any detrimental effects, particularly rock movement or surface damage, as a result of the construction works.

References

- Gunn, R.G. 2011 *Dampier Highway Duplication Project, Dampier, WA: Initial assessment of the effects of blasting on National Heritage Places within the Works Area*. Report to Highway Construction, Cottesloe, WA.
- Gunn, R.G. 2012 *Dampier Highway Duplication Project, Dampier, WA: instillation and assessment of protective measures for select rock art panels*. Report to Highway Works Albem (HWA) Joint Venture, Claremont, WA.
- Jo MacDonald CHM Pty Ltd 2010 *Statement of Significant Impacts: Dampier Highway Upgrade through Dampier Archipelago (including Burrup Peninsula) National Heritage Place*. Report to Main Roads WA.
- Jo MacDonald CHM Pty Ltd 2011 *Aboriginal Heritage Management Plan: Dampier Highway duplication in the Dampier Archipelago (including Burrup Peninsula) National Heritage Place*. Report to Main Roads WA.

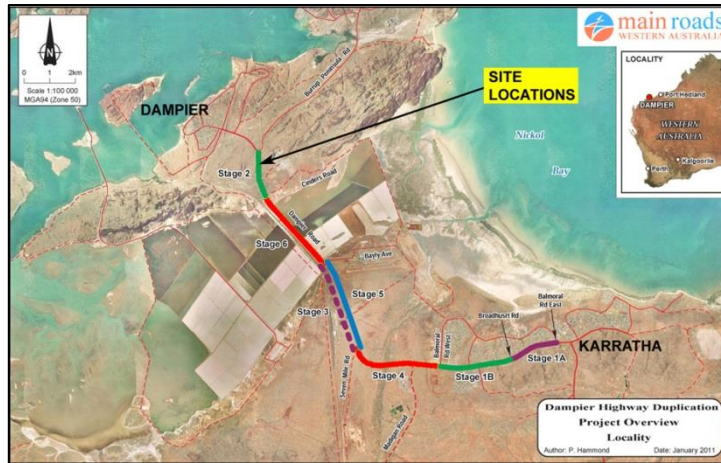


FIGURE 1: Location of the development, Dampier, Western Australia

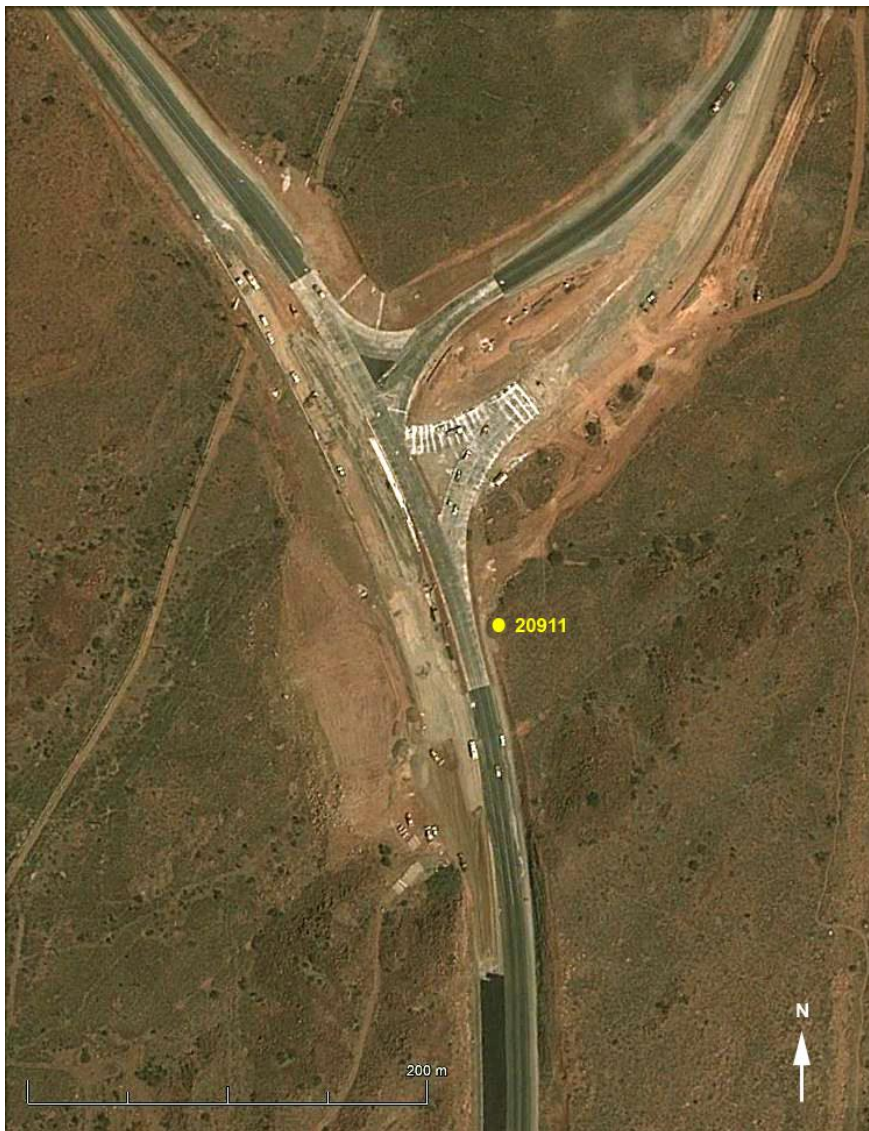


FIGURE 2: Location of DIA site 20911
(Source Google Earth image 13th Nov. 2012: accessed 26th May 2013)



FIGURE 3: Location of site 20911 adjacent to the works area (March 2012)



FIGURE 4: Site 20911 from the north-east, south and north (May 2013)



FIGURE 5: Site 20911 pre- and post-development showing no disturbance to the site rocks



FIGURE 6: Site 20911 petroglyph, May 2013